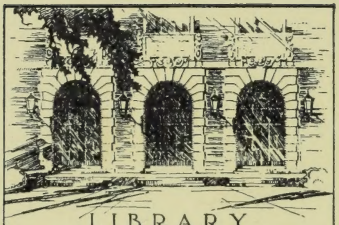

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DELAWARE COLLEGE BULLETIN

VOLUME X NEW SERIES NUMBER 2

FEBRUARY, 1915

ANNUAL CATALOGUE

1914-1915

PUBLISHED QUARTERLY BY THE COLLEGE

NEWARK, DELAWARE

Entered June 22, 1904, at Newark, Delaware, as second-class matter
under Act of Congress of July 19, 1894

CATALOGUE

OF

DELAWARE COLLEGE

1914-1915

WITH

ANNOUNCEMENTS FOR 1915-1916

PUBLISHED BY THE COLLEGE

NEWARK, DELAWARE

CALENDAR

1915		
March 2	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 1	Thursday	Easter recess begins, 4.45 p. m.
April 6	Tuesday	Easter recess ends, 8.45 a. m.
May 30	Sunday	Memorial Day
May 31-June 5		**Final Examinations**
June 6	Sunday	Sermon—Young Men's Christian Association, 11 a. m. Baccalaureate Sermon, 8 p. m.
June 7	Monday	Farmers' Day at the College Farm Class Day Exercises, 3 p. m.
June 8	Tuesday	Meeting of the Trustees, 10.30 a. m. Inter-class Field and Track Meet, 2.30 p. m.
June 9	Wednesday	Commencement Exercises, 10.30 a. m. Alumni Luncheon and Meeting, 1 p. m. Exhibition Drill, 3.30 p. m.
June 11, 12		**Examinations for Admission**

SUMMER VACATION

June 28	Monday	Summer School for Teachers opens.
August 6	Friday	Summer School for Teachers closes.
September 14, 15		**Examinations for Admission**

September 16	Thursday	First term begins, 8.45 a. m.
November 25	Thursday	Thanksgiving Day: a holiday
November 30	Tuesday	Meeting of the Trustees, 10.30 a. m.
December 23	Thursday	Christmas recess begins, 4.45 p. m.
1916		
January 3	Monday	Christmas recess ends, 8.45 a. m.
January 24-29		**Mid-Year Examinations**
January 31	Monday	Second term begins, 8.45 a. m.
March 7	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 20	Thursday	Easter recess begins, 4.45 p. m.
April 25	Tuesday	Easter recess ends, 8.45 a. m.
May 30		Memorial Day
June 5-10		**Final Examinations**
June 11	Sunday	Sermon—Young Men's Christian Association, 11 a. m. Baccalaureate Sermon, 8 p. m.
June 12	Monday	Farmers' Day at the College Farm
June 13	Tuesday	Meeting of the Trustees, 10.30 a. m.
June 14	Wednesday	Commencement Day
June 16-17		**Examinations for Admission**

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Instructor in Horticulture

Frank B. Hills, M. S.
Instructor in Animal Husbanary

H. H. Hillegass
Instructor in Electrical Engineering

Reeves D. String
Instructor in Shop Work

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Assistant Librarian, May G. Kerr
Supervising Architect, Frank Miles Day, D. S.
Secretary to the President, Margaret Bowen
Assistant to the Treasurer, Eleanor Todd
Superintendent of Grounds and Buildings, Lee Rose

STANDING COMMITTEES OF THE FACULTY

Admission: Professor Short, Chairman; Professor Hayward, Professor Sypherd.

Advanced Standing: Arts and Science—Professor Sypherd, Chairman; Professor Conover, Professor Vaughn. Agriculture—Professor Hayward, Chairman; Engineering—Professor Robinson, Chairman; Professor M. Van G. Smith, Professor Koerber.

Athletics: Faculty Representatives on the Athletic Council—Professor Edw. Laurence Smith, President; Professor McCue, Vice President; Mr. McAvoy, Manager.

Board of Advisers: For the Senior Class, Professor Koerber; for the Junior Class, Professor E. L. Smith; for the Sophomore Class, Professor C. A. Short; for the Freshman Class, Professor Sypherd.

Extension: Professor Vaughn, Chairman; Professor Reed, Professor Short.

Lectures: Professor McCue; Professor E. L. Smith, Professor Sypherd.

Prizes: Professor Sypherd, Chairman; Professor Conover, Professor Reed.

Publicity: Professor Dutton, Chairman; Professor Srager, Mr. Pailthorpe.

Schedule: Professor M. Van G. Smith, Chairman; Professor Conover, Professor E. L. Smith.

Scholarship: Professor Hayward, Chairman; Professor Vaughn, Professor Sypherd, Professor M. Van G. Smith, Professor E. L. Smith.

Student Entertainments: Professor Dutton, Chairman; Professor Sypherd, Mr. Preston.

EXPERIMENT STATION

The Experiment Station, a department of the college, is under the control of the Board of Trustees. Between meetings of the Board, it is immediately in charge of the Committee on Agriculture.

STATION STAFF

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Charles A. McCue, B. S., Horticulturist

Arthur E. Grantham, B. A., B. S. A., Agronomist

Firman Thompson, B. S., Chemist

Thomas F. Manns, B. S., M. S., Ph. D., Plant Pathologist

Jacob J. Taubenhaus, M. S. A., Ph. D., Associate Plant Pathologist

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———— ————, Assistant State Leader and Extension Worker in Home Economics

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Melville O. Pence, Kent
Ward C. Pelton, Sussex

DELAWARE COLLEGE

LOCATION

DELAWARE COLLEGE is situated at Newark, a quiet, well-ordered, and hospitable village of two thousand inhabitants in the northwestern part of the State. Newark is connected with Philadelphia, Wilmington, Baltimore, and Washington by the Pennsylvania, and Baltimore and Ohio Railroads, and there are few points in Delaware or in the Peninsular counties of Maryland distant from the village more than a few hours by rail. The region about Newark is one of the most healthful and beautiful on the Atlantic slope. The site of the college, near the center of the town, is one of unusual charm. The village has a supply of excellent water and is lighted by electricity. The healthfulness and attractiveness of the town have been greatly enhanced by the recent completion of a fine sewerage system.

FOUNDATION

Delaware College was chartered in 1833 by Act of the Delaware Legislature, and the doors of the college were first opened to students in May of the following year. The college had been doing for a quarter of a century an important work not only for Delaware, but as well for neighboring parts of Pennsylvania and Maryland, when, by a succession of misfortunes, she was forced in the spring of 1859 to close her doors.

Eleven years later, in the spring of 1870, the college was resuscitated, having meanwhile been designated by Act of the Delaware Legislature as beneficiary under the Act of Congress apportioning to each of the several States large areas of public lands to form the basis of endowments for Colleges especially devoted to the teaching of Agriculture and the Mechanic Arts, and Military Tactics. This Act of Congress, commonly known as the "Morrill

Bill," from its originator, Senator Morrill of Vermont, declares that the colleges made beneficiary under its provisions shall have as their leading object, "without excluding other scientific and classical studies and including Military Tactics, to teach such branches of learning as are related to Agriculture and the Mechanic Arts * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." In consideration of the designation and establishment of Delaware College as the institution to be provided by the State of Delaware in accordance with the provisions of the Act of Congress in question, " a joint and equal interest in the grounds, buildings, libraries, and vested funds of the College proper," was conveyed to the State of Delaware, and equal representation upon the Board of Trustees was given to the State.

The college was thus under combined private and State ownership until the legislative session of 1913, when, according to the terms of the Act to reincorporate Delaware College, approved March 19, 1913, it came into the sole possession of the State of Delaware. It is now in the full sense of the word a State College. The Board of Trustees "shall consist of twenty-eight members, together with the Governor of the State, the President of the College, the Master of the State Grange, and the President of the State Board of Education, all of whom shall be members of the Board, ex officio."

BUILDINGS AND GROUNDS

The buildings of the college, situated in an ample and beautiful campus, shaded by trees as old as the institution itself, consist of the Dormitory, a large brick structure originally the sole college building for all purposes and still occupied, not only for lodgings, but also for laboratories and recitation rooms; the library; Recitation Hall, a handsome brick building erected by the State in 1891; the woodworking and machine shop, where are housed machinery and apparatus for a thorough prac-

tical course of instruction in the mechanic arts; the Gymnasium; the Experiment Station, which contains the offices, libraries, and laboratories of the station workers; a heating plant with underground conduits to distribute steam to the various buildings; a large green-house for instruction and experimentation.

A considerable part of the rear campus is occupied as an athletic field and affords excellent facilities for outdoor sports and games.

Connected with the college, and used for purposes of instruction and experimentation, is the State Farm, a farm of 217 acres.

The buildings of The Women's College of Delaware, affiliated with Delaware College, are located on a plot of nineteen acres, half a mile from the college.

FINANCIAL SUPPORT

From 1870 to 1913 the college was supported entirely by Federal and State appropriations. As the result of the passage of the "Morrill Bill" of 1862, the college receives the income from the sale of public lands apportioned to the State of Delaware, the amount being $4980. Under the provisions of the "Hatch Bill," 1887, the Delaware College Agricultural Experiment Station was established. The station receives $15,000 annually from this bill, and $15,000 addition annually from the "Adams Bill," 1906. From the "New Morrill Bill," 1890, the college receives now $20,000 annually, the expenditure of this sum being subject to the provisions of the "Morrill Bill" of 1862. This Act was supplemented by the passage of the "Nelson Bill," 1907, from which the college receives $20,000 annually. The appropriations provided for in this Act are to be applied "to instruction in Agriculture, the Mechanic Arts, the English Language, and the various branches of mathematical, physical, natural, and economic sciences with special reference to their application in the industries of life, and to the facilities for such instruction." In 1914 the Alumni Association established the Alumni En-

dowment Fund, the income to be used to pay the President's salary. This fund has already reached the sum of $67,000.

The Smith-Lever Extension Bill, passed in 1914, appropriates $10,000 annually to each State and a proportionate share in an increasing appropriation beginning at $600,000 and reaching $3,000,000 in five years, depending upon the population of the State. In order to participate in the latter appropriation the State must appropriate an amount equal to that which is its share from the federal government beyond the fixed appropriation.

Apart from the National appropriations, the State has dealt liberally with the college in the past, having appropriated funds from time to time as they were needed for new buildings and the growing wants of the Institution.

SCOPE OF THE WORK

Courses of Instruction

The following Courses of Instruction are offered by Delaware College:

I **Arts and Science,** a four years' course, leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Agriculture,** a four years' course, leading to the degree of Bachelor of Science.

III **Engineering**—Civil, Mechanical, Electrical, and Chemical, four years' courses, leading to the degree of Bachelor of Science.

A two years' course in Agriculture, leading to a certificate, is offered to students of sufficient maturity who for good reasons are unable to meet the usual requirements for admission to the college.

Tuition is free to all students from the State of Delaware. The college constitutes a part of our system of free public instruction. In its scheme of education, the culture of liberal learning and the practical usefulness of the applied sciences are equally emphasized.

Extension Work

Agriculture. The Agricultural Extension work of Delaware College is supported by a Federal appropriation known as the Smith-Lever fund, supplemented by State appropriations. The work is carried on largely by County Agents, one of whom is located in each county, and by a woman trained in home administration who spends practically the whole of her time in the field.

The function of the field agent is to supply the people with the most helpful information, and render any service possible in the development of the agricultural resources of the State.

The college co-operates with the field workers by supplying material and furnishing lectures, as well as by planning and assisting in inaugurating new projects.

Special Courses. The beginning of a system of extension courses of instruction was made in September, 1914, when two courses in English were offered to teachers and to other persons who could not avail themselves of the regular courses at the college. Information in regard to this work will be given on application.

General Lectures. The members of the Faculty of Delaware College and of the Women's College of Delaware will, as far as their time permits, deliver lectures before the schools, women's clubs, and other organizations throughout the State. The list of lecturers and lectures is given on pages 109 to 112.

The Summer School. For the benefit of teachers and of others who are qualified to do the work, the Faculty of Delaware College conducts a Summer Session of six weeks duration. Courses are offered in the methods of teaching and school management and also in subjects directly related to the work of grammar and high school teachers. Tuition is free to students from Delaware. The session of 1915 will open on June 28. Information will be furnished by the Director of the Summer School.

The Experiment Station

The Delaware College Experiment Station, a research department of the college, was made possible by an Act of Congress passed in 1887 known as the Hatch Act. Under the Provisions of this Act each state received an annual appropriation of $15,000 for the establishment of an Agricultural Experiment Station. This was supplemented in 1906 by a similar Act known as the Adams Act, which carried an annual appropriation of $15,000 for the use of the Agricultural Experiment Stations that had been established under the law of 1887.

The Experiment Station has a library, research laboratories, and a separately organized staff. It is investigating problems in the fields of Agronomy, Horticulture, Chemistry, Plant Pathology, Soil Bacteriology, and Animal Husbandry. The results of its investigations are published in the form of bulletins, which are distributed free of charge to those interested.

The Women's College of Delaware

Affiliated with Delaware College is the Women's College of Delaware, established by the State in September, 1914. The college offers three courses of instruction leading to degrees:

I **Arts and Science,** a four years' course leading to the degree of B. A. or B. S.

II **Education,** a four years' course leading to the degree of B. S.

III **Home Economics,** a four years' course leading to the degree of B. S.

In addition to these regular courses, two years' courses in Education and in Home Economics are offered to students who are qualified to do the work. Tuition is free to students from the State of Delaware. Information in regard to the college may be obtained from the Dean of the Women's College.

REQUIREMENTS FOR ADMISSION

GENERAL REGULATIONS

Candidates for admission to the Freshman class must be at least 16 years of age and of good moral character.

They must have completed the regular academic course in a recognized high school or preparatory school, or have done an equivalent amount of work.

Candidates wishing to receive entrance credits on subjects not offered in the schools from which they present their certificates are required to take examinations in such subjects on days prescribed in the Calendar of the college.

An entrance examination in English Composition is required of all candidates for admission.

Candidates coming from other institutions of collegiate rank must present certificates of honorable dismissal.

It is desirable for students to enter at the **beginning of the first term,** because the subjects which are begun at that time are not repeated in the second term.

Students will not be permitted to enter the college in the first term after October 15, unless they have completed an amount of work equivalent to the work of the classes which they wish to enter.

Candidates for admission are advised to send to the Chairman of the Committee on Admission before Tuesday, September 14, 1915, certificates specifying subjects which they wish to offer for entrance to the several courses.

Specific requirements for admission to the several courses are given below.

Course in Arts and Science	Group A Group B, 7 a or b, and four other subjects, of which one must be Latin, if a student is a candidate for the A. B. degree

Course in Agriculture	**Group A** Group B, 9 a or c and f, and three other subjects
Courses in Engineering	Group A Group B, 8 c, 9 a, and two other subjects

Candidates for admission to the Course in Arts and Science or Agriculture who offer Latin or Greek from Group B may count each as two subjects.

Group A

1 English
- Composition
- Literature

2 Mathematics
- (a) Algebra through Quadratics
- (b) Plane Geometry

3 History
- United States
- Civil Government of the U. S.

4 Modern Language
- German or French

Group B

5 Latin

6 Greek

7 History
- (a) Ancient
- (b) English
- (c) Mediaeval and Modern

8 Mathematics
- (c) Solid Geometry
- (d) Advanced Algebra
- (e) Plane Trigonometry

9 Natural Science
- (a) Physics
- (b) Chemistry
- (c) Physiology
- (d) Botany
- (e) Zoology
- (f) Physical Geography

Detailed Explanation of the Requirements for Admission

English—Group A (1)

All candidates for entrance, whether graduates of high schools or no, must undergo an examination in English Composition. Certificates will be accepted only for the Literature which is supposed to be read and studied. These certificates must state definitely which books have been read and which read and studied. An amount of reading and study in general literature equivalent to the required books will be accepted if the certificates of applicants are properly signed by principals or other teachers in the schools.

Requirements for students entering in 1915 and 1916

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

English Grammar and Composition

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description, and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be

accompanied by concerted efforts of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

Literature

The second object is sought by means of two lists of books, headed respectively **Reading** and **Study,** from which may be framed a progressive course in literature covering four years. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

a **Reading.** The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units* are to be selected, two from each group:

I The Old Testament, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel together with the books of Ruth and Esther; the Odyssey, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the Iliad, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Vergil's Aeneid. The Odyssey, Iliad, and

*Each unit is set off by semicolons.

Aeneid should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

II Shakspere's Merchant of Venice; Midsummer Night's Dream; As You Like It; Twelfth Night; Henry the Fifth; Julius Caesar.

III Defoe's Robinson Crusoe, Part I; Goldsmith's Vicar of Wakefield; either Scott's Ivanhoe, or Scott's Quentin Durward; Hawthorne's House of the Seven Gables; either Dickens' David Copperfield, or Dickens' Tale of Two Cities; Thackeray's Henry Esmond; Mrs. Gaskell's Cranford; George Eliot's Silas Marner; Stevenson's Treasure Island.

IV Bunyan's Pilgrim's Progress, Part I; The Sir Roger de Coverley Papers in the Spectator; Franklin's Autobiography (condensed); Irving's Sketch Book; Macaulay's Essays on Lord Clive and Warren Hastings; Thackeray's English Humorists; Selections from Lincoln, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and Letter to Horace Greeley, along with a brief memoir or estimate; Parkman's Oregon Trail; either Thoreau's Walden, or Huxley's Autobiography and selections from Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and a Piece of Chalk; Stevenson's Inland Voyage and Travels with a Donkey.

V Palgrave's Golden Treasury (First Series), Books II and III, with especial attention to Dryden, Collins, Gray, Cowper, and Burns; Gray's Elegy in a Country Churchyard and Goldsmith's Deserted Village; Coleridge's Ancient Mariner and Lowell's Vision of Sir Launfal; Scott's Lady of the Lake; Byron's Childe Harold, Canto IV, and Prisoner of Chillon; Palgrave's Golden Treasury (First Series), Book IV, with especial attention to Words-

worth, Keats, and Shelley; Poe's Raven, Longfellow's Courtship of Miles Standish, and Whittier's Snow Bound; Macaulay's Lays of Ancient Rome and Arnold's Sohrab and Rustum; Tennyson's Gareth and Lynette, Lancelot and Elaine, and The Passing of Arthur; Browning's Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City.

Note: The following ten units from the five groups are recommended.

The Old Testament; the Odyssey; Shakspere's As You Like It, and Julius Caesar; Defoe's Robinson Crusoe, Part I; Scott's Quentin Durward; Selections from Lincoln; Macaulay's Lord Clive and Warren Hastings; Gray's Elegy in a Country Churchyard and Goldsmith's Deserted Village; Macaulay's Lays of Ancient Rome and Arnold's Sohrab and Rustum.

b Study. This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. For this close reading are provided a play, a group of poems, an oration, and an essay, as follows:

Shakspere's Macbeth; Milton's L'Allegro, Il Penseroso, and Comus; either Burke's Speech on Conciliation with America or both Washington's Farewell Address and Webster's First Bunker Hill Oration; either Macaulay's Life of Johnson or Carlyle's Essay on Burns.

Examination

However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling, or other essentials of good usage.

The examination will be divided into two parts, one

of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies, and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include:

A General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under **(a) Reading,** above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

B A test on the books prescribed for **Study,** which will consist of questions upon their content, form, and structure, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of the works, and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their other works, and the periods of literary history to which they belong.

History and Civil Government—Group A (3), Group B (7 a, b, c)

(a) United States History. At least one full year's work of fairly advanced grade is necessary in this subject. Geography and collateral reading must be given some emphasis.

(b) Ancient History, or English History. The requirement is a regular year's work in one of these subjects. In this course the student should learn to handle books and to appreciate systematic habits of work.

(c) Civil Government. Whether given separately or in connection with United States History, this work must be the equivalent of a regular course pursued for a half year. Considerable attention should be given to the actual workings of government.

Mathematics—Group A (2), Group B (8 a, b, c)

(a) Algebra. The four fundamental operations, with emphasis placed upon type form in multiplication and division, factoring, highest common factor, least common multiple, fractions, fractional equations, simultaneous equations of first degree, evolution, theory of exponents, radicals, quadratic equations of one unknown quantity and solution of problems. Emphasis should be placed on factoring and solution of literal equations.

(b) Plane Geometry. The usual theorems and constructions of good elementary text books. An important part of the work should be solution of original exercises, including loci and numerical problems. Accuracy and acuteness in thinking are desired more than mere geometrical knowledge.

(c) Solid Geometry. The usual theorems and constructions of good text books; relations of lines and planes; properties of prisms, pyramids, cylinders, cones; the sphere and spherical triangle. Emphasis should be

placed on problems of mensuration, loci, and the relation of parts in spherical triangles and polygons.

(d) Advanced Algebra. Convergency and Summation of Series, Binomial Theorem, Permutations and Combinations, Undetermined Coefficients, Logarithms, Theory of Equations, and Determinants.

(e) Plane Trigonometry. Trigonometric ratios and their relations; derivation of general ratios; proofs of general formulas, especially trigonometric functions of sum of two angles, difference of two angles, and multiple angles; proving of identities; use of logarithms and solution of right and oblique triangles.

Physics—Group B (9 a)

The completion of an ordinary text-book together with a sufficient number of laboratory exercises to illustrate the work is required of candidates. This work may be accomplished in one year by taking daily recitations and exercises.

Latin—Group B (5)

1 The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less in amount than Caesar, Gallic War, I-IV; Cicero, the orations against Catiline, for Manilian Law, and for Archias; Vergil, Aeneid, I-VI.

2 The amount of reading specified above shall be selected by the schools from the following authors and works; Caesar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters and De Senectute) and Sallust (Catiline and Jugurthine War); Vergil (Bucolics, Georgics, and Aeneid) and Ovid (Metamorphoses, Fasti, and Tristia).

3 Grammar and Composition. The examination in grammar and composition will demand thorough know-

ledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The Roman method of pronunciation is used.

Greek—Group B (6)

Xenophon, Anabasis, Books I-IV. Homer, Iliad, Books I-III. A thorough knowledge of Greek Grammar.

Modern Languages—Group A (4)

(a) German, Elementary. 1, careful drill in pronunciation; 2, the memorizing and frequent repetition of easy colloquial sentences; 3, drill upon the rudiments of grammar, that is, upon the inflection of the articles, of such nouns as belong to the language of every-day life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word order; 4, abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; 5, the reading of from 100 to 125 pages of graduated texts.

(b) French, Elementary. 1, careful drill in pronunciation; 2, the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural nouns, the inflection of adjectives, participles, and pronouns; the use of the personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; 3, abundant easy exercises, designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; 4, the reading of from 100 to 125 pages of graduated texts.

Natural Science—Group B (9)

One year's work of 38 weeks, five recitations weekly, of high school grade, covering the elementary principles of any one of the several sciences, will be accepted as an entrance requirement. The student in addition to the examination must submit his notes on laboratory or field work of the year.

ADMISSION TO ADVANCED STANDING

Candidates for entrance to an advanced class in any of the courses are required either to sustain examinations in all studies of the course up to the point at which they seek admission, or to present from other colleges certificates covering such studies.

ENTRANCE EXAMINATIONS

Entrance examinations will be held at the college in Newark, on Friday and Saturday, June 11 and 12, 1915, beginning at 9 a. m., also on Tuesday and Wednesday, September 14 and 15, 1915, at the same hours.

Ancient History or English History—9.00-10.30, Friday, June 11, and Tuesday, September 14.

Algebra—10.30-12.30, Friday, June 11, and Tuesday, September 14.

Geometry—1.30-3.00, Friday, June 11, and Tuesday, September 14.

Latin—3.15-4.30, Friday, June 11, and Tuesday, September 14.

Greek and Physics—9.00-10.30, Saturday, June 12, and Wednesday, September 15.

English—10.30-12.30, Saturday, June 12, and Wednesday, September 15.

History of the United States and Civil Government—1.15-2.45, Saturday, June 12, and Wednesday, September 15.

Solid Geometry—2.45-4.30, Saturday, June 12, and Wednesday, September 15.

Hours for examinations in other subjects under Group B will be arranged for with the candidates who offer such subjects.

COURSES OF STUDY

Delaware College offers the following courses of study:

I **Arts and Science**—A four years' course leading to the degree of B. A. or B. S.

II **Agriculture**—A four years' course leading to the degree of B. S. in Agriculture.
—A two years' course leading to a certificate.

III **Engineering**—Civil, Mechanical, Electrical, Chemical—a four years' course leading to the degree of B. S. in the special field of study.

CHOICE OF STUDY

Students may, with the approval of their parents or guardians, enter any one of the departments; or they may select such studies as they are prepared to pursue, when circumstances make it advisable not to enter a regular course. Except in the case of mature students who may desire to do special work in any department, it is strongly urged that all applicants for admission prepare themselves for undertaking the work of a regular course. Opportunity is offered students of sufficient maturity and preparation, who do not wish to take any of the regular courses, to pursue special studies determined by some definite end in view.

Each special student is required to have at least fifteen recitations, or their equivalent, weekly, unless specially excused for cause.

Changes from one course to another may be made only at the opening of a term, with the approval of the Faculty and the consent of the parent or guardian.

COURSE IN ARTS AND SCIENCE

This course is designed to meet the requirements of a liberal education and to lay the foundation for professional and business careers. In accordance with this general aim considerable freedom in the choice of studies is allowed, particularly in the last two years of the course. The studies of the Freshman year are virtually prescribed.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 128 credit term-hours of work in addition to Military Science and Physical Training. During the Senior year, every candidate for graduation must submit a satisfactory thesis to the Head of the Department in which he has taken his major study.

Graduates from the course in Arts and Science who have offered for admission four years of Latin or who have completed in college an equivalent amount of work in Latin will receive the degree of Bachelor of Arts; all other graduates will receive the degree of Bachelor of Science.

Prescribed Studies

	Term Hours	Credits
English	14	14
Mathematics	8	8
Modern Language	12	12
Science (Chemistry, 6; Zoology, Botany, or Physics, 6	12	12
History and Economics	12	12
Rhetoric and Oratory	2	2
	60	60
Military Drill	24	16
Physical Training	4	2

FRESHMAN YEAR

First Term	H.*	C.	*Second Term*	H.	C.
English, 1	2	2	English, 1	2	2
Mathematics, 1, 2a	4	4	Mathematics, 3, 4	4	4
Language—Latin, French, or German ..	3	3	Language—Latin, French, or German ..	3	3
History, 1	3	3	History, 1	3	3
Rhetoric and Oratory, 1	1	1	Rhetoric and Oratory, 1	1	1
Elective—Two subjects (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6	Elective—Two subjects (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6
Military Science, 1 ...	3	2	Military Science, 1 ...	3	2
Physical Training, 1...	1	0.5	Physical Training, 1...	1	0.5

* The capital letters H. and C. refer to Actual Hours and Credit Hours respectively.

SOPHOMORE, JUNIOR, AND SENIOR YEARS

At the beginning of the Sophomore year, every candidate for the degree of Bachelor of Arts or Bachelor of Science shall select from the following groups a major study, in which he shall complete thereafter 18 hours of work. In addition, he must take from the group from which he selects his major at least one additional course after the Freshman year.

During these three years students must take in addition to the required work in Military Science and Physical Training all prescribed subjects not completed in the Freshman year and Elective courses sufficient to make a total of thirty credit term-hours each year.

Group A	**Group B**
Greek	Biology
Latin	Chemistry
French	Mathematics and Physics
German	
English	
History and Economics	

Elective Courses

	First Term	*Second Term*
Ancient Languages, 1	3	3
Ancient Languages, 2	3	3
Ancient Languages, 3	3	3
Ancient Languages, 5	3	3
Ancient Languages, 6	3	3
Ancient Languages, 7	3	3
Ancient Languages, 10	3	3
Bacteriology, 1	3	3
Bacteriology, 2	1	1
Bacteriology, 5	3-5	3-5
Biology, 1	3	3
Biology, 2, 3	2	2
Biology, 4	3	3
Biology, 5	2	2
Chemistry, 2	3	3
Chemistry, 3	1.5	–
Chemistry, 4	–	1.5
Chemistry, 6	1.5	–
Chemistry, 7	3	3
Chemistry, 8	2	–
Chemistry, 9	1	–
Chemistry, 10	6	6
Chemistry, 11	1.5	–
Chemistry, 12	–	2
Chemistry, 13	1	–
Chemistry, 14	–	1
English, 4, 5	3	3
English, 8	2	2
English, 12	–	2
History, 5	3	–
History, 6	–	3
History, 9	3	–
History, 10	–	3
History, 11	2-3	–
History, 12	1	1
Horticulture, 4	3	–
Mathematics, 6	4	–
Mathematics, 7	–	4
Mathematics, 8	3	3
Mathematics, 9	2	2
Mathematics, 12	.	
Mathematics, 13	–	2
Mathematics, 14	2	–
Mathematics, 15	–	2
Mineralogy, 1	3	–
Mineralogy, 2	–	3
Modern Languages, 1	3	3
Modern Languages, 2	3	3
Modern Languages, 3	3	3
Modern Languages, 4	3	3
Modern Languages, 5	3	3
Modern Languages, 6	3	3
Modern Languages, 7	3	3
Modern Languages, 8	3	3
Modern Languages, 9	3	3
Modern Languages, 10	3	3
Modern Languages, 11	3	3
Modern Languages, 12	3	3
Modern Languages, 13	3	3
Modern Languages, 14	2	2
Philosophy, 1	3	–
Philosophy, 2	–	3
Physics, 1	3	3
Physics, 2, 3	2	1
Physics, 4	4	3
Rhetoric & Oratory, 4	1	1
Rhetoric & Oratory, 5	1	1

COURSES IN AGRICULTURE

THE FOUR YEARS' COURSE

The course in Agriculture leading to a degree combines a technical course with as much cultural training as possible. It includes a good foundation in the fundamental sciences upon which is built a vocational superstructure.

The work is planned for the preparation of men who desire to become teachers of agriculture, farm managers, investigators, or specialists in some one of the various phases of Agriculture. To aid those who are undecided as to which lines they are best adapted, presentation subjects of the various branches are required early in the course. The opportunity to specialize in any of the major branches is reserved until the Senior year.

A considerable amount of practice work is given throughout the course both in the laboratories and upon the farm, and prospective students are urged to spend at least one whole summer upon a well managed farm before entering college to the end that they may more fully appreciate the course of study. Also during the four years' course their work is made much stronger by supplementing it with farm work during the long vacations. The various professors of the Agricultural Department are glad to aid students in finding suitable farms for this purpose.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	2	2	English, 1	2	2
Mathematics, 1, 2a	4	4	Agronomy, 1, 2	4	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Animal Husbandry, 1	4	3	Biology, 4	5	3
Biology, 4	5	3	Chemistry, 1	3	3
Chemistry, 1	3	3	Animal Husbandry, 2	4	3
History, 2	1	1	Military Science, 1	3	2
Military Science, 1	3	2	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Chemistry, 2	3	3	Chemistry, 2	3	3
Chemistry, 3	3	1.5	Chemistry, 4	3	1.5
Horticulture, 1	3	2	Horticulture, 2	4	3
Agronomy, 1, 2	4	3	Agronomy, 3	4	3
Physics, 1, 2	5	4	Physics, 1, 2	5	4
Military Science, 2	3	2	Military Science, 2	3	2
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Biology, 1	5	3	Biology, 1	5	3
Horticulture, 3	4	3	Horticulture, 3	4	3
Agronomy, 4	4	3	Agronomy, 5	4	3
Animal Husbandry, 3	2	2	Animal Husbandry, 4	2	2
Bacteriology, 1	5	3	Bacteriology, 1	5	3
Chemistry, 5	3	3	Chemistry, 5	3	3
Rhetoric and Oratory, 3	1	1	Rhetoric and Oratory, 3	1	1
Military Science, 3	3	2	Militaıy Science, 3	3	2

SENIOR YEAR

Required Courses

First Term	H.	C.	*Second Term*	H.	C.
English, 10	1	1	Agronomy, 7	5	3
Economics, 7	3	3	Soil Bacteriology, 1	5	3
Agronomy, 6	4	3	Military Science, 4	3	2
Horticulture, 4	3	3			
Military Science, 4	3	2			

Elective Courses

Seniors in Agriculture may elect Agronomy, or Animal Husbandry, or Horticulture, for major work. In addition to the required courses listed above, enough of the elective courses must be chosen to make a total for each term of not less than fifteen credit hours, exclusive of Military Science.

First Term	H.	C.
Biology, 3	2	2
Biology, 5	4	2
Agronomy, 9	5	3
Agronomy, 10	1	1
Animal Husbandry, 5	4	2
Animal Husbandry, 6	4	2
Horticulture, 5	2	2
Horticulture, 7	2	2
Rhetoric and Oratory, 4	1	1
Rhetoric and Oratory, 5	1	1

Second Term	H.	C.
English, 10	1	1
Bacteriology, 3	3	3
Biology, 3	2	2
Biology, 5	4	2
Agronomy, 8	3	2
Agronomy, 10	1	1
Animal Husbandry, 7	2	2
Animal Husbandry, 8	4	2
Dairying, 1	3	2
Horticulture, 6	2	2
Horticulture, 8	2	2
Horticulture, 9	3	3
Horticulture, 10	1	1
Rhetoric and Oratory, 4	1	1
Rhetoric and Oratory, 5	1	1

THE TWO YEARS' COURSE

The two years' course in Agriculture is intended for those who, for various reasons, are unable to avail themselves of the opportunities offered by the four years' course leading to a degree.

There are no entrance requirements other than that a student must be at least eighteen years of age, of good character, and have a desire to become familiar with some of the fundamental principles of agriculture.

Students who are registered in this course must make satisfactory progress in order to remain in college. A certificate of proficiency will be given to those students who complete the work of the course.

REQUIREMENTS FOR CERTIFICATE

FIRST YEAR

First Term	H.	C.
History, 2	1	1
Biology, 4	5	3
Chemistry, 1	3	3
Agronomy, 1 and 2	4	3
Animal Husbandry, 1	4	3
Horticulture, 1	3	2
Military Science, 1	3	2
Physical Training	1	0.5

Second Term	H.	C.
Biology, 4	5	3
Chemistry, 1	3	3
Agronomy, 1 and 2	4	3
Animal Husbandry, 2	4	3
Horticulture, 2	4	3
Military Science, 1	3	2
Physical Training	1	0.5

SECOND YEAR

First Term	H.	C.	*Second Term*	H.	C.
Biology, 3	2	2	Biology, 3	2	2
Bacteriology, 4	2	2	Agronomy, 3, 5, or 7	4	3
Agronomy, 6	4	3	Animal Husbandry, 8	4	2
Animal Husbandry, 9	3	3	Dairying, 1	3	2
Horticulture, 3	4	3	Horticulture, 3	4	3
Horticulture, 5	2	2	Bacteriology, 3	3	3
Physical Training	1	0.5	Physical Training	1	0.5
Military Science	3	2	Military Science	3	2

In addition to the foregoing subjects, all students in the two years' course must take a course in English Composition in the Freshman year.

COURSES IN ENGINEERING

CIVIL ENGINEERING

The objects of the course of instruction in Civil Engineering are, first, to fit those pursuing it previous to professional life to be, at graduation, immediately useful as assistants to practicing engineers and capable of rising immediately to positions of responsibility; second, to meet the needs of those who, having been engaged, without a course of technical instruction, in professional work, desire to equip themselves for more successful competition with those who have had such instruction. As the objects can be most satisfactorily accomplished by such instruction as will impart accurate knowledge of natural laws and of the properties of materials and such training as will develop power to apply that knowledge intelligently, the technical studies are preceded by liberal and thorough instruction in language and in the mathematical and physical sciences.

The outline of the course of study in Civil Engineering on pages 44, 45 shows the subjects pursued, the number of hours per week, and the credit hours assigned to exercises in each. Full information regarding the subjects is given on pages 64 to 68. Mature students of suffi-

cient preparation may arrange for such modifications of the required work of the Senior year as will enable them to devote more time to a special subject or to pursue advanced work.

Instruction is by recitations, lectures, laboratory, drafting-room, field and shop-work; by the use of current technical journals; and by visits, followed by reports, to structures in process of erection, good types of finished structures, and industrial establishments.

The main objects in laboratory, field, and shop-work are to secure mental discipline; and, by illustrating principles and impressing facts, to supplement the work of the lecture room. Without subordinating the true educational function of these methods, work is so carried on as to give the student intelligent preparation for similar work after graduation.

The visits of inspection, in which the students are accompanied by members of the faculty, and the reports thereon are considered very important in developing correct methods of observation, note taking, and description; in forming acquaintance with engineering works and industrial processes; and in bringing students in contact with business men and with engineers engaged in the practice of their profession.

Examinations are held at the close of each term.

The college is well supplied with the necessary instruments, machines, and tools for laboratory, field, and shop-work. The equipment is of the best quality and is yearly being increased. The Department has a working library, kept up to date, containing standard works in all branches of civil engineering. It is supplied, also, with the leading professional and other scientific periodicals, both American and foreign. Students are encouraged and taught to avail themselves of current technical matter in foreign languages as well as in their own.

The Department is in complete and successful operation. The training is thorough and the instruction such as to meet the demands of life. About three-fourths of

those who have completed this course are engaged in professional work, in which they are making rapid advancement. Those graduates who have not entered the engineering profession are pursuing, with success, teaching, law, and business careers.

In regard to obtaining situations it may be said that frequently students have been able to engage themselves, during their long vacations, in engineering work; and some have, in this way, secured permanent positions to be occupied at the completion of the course. While the opportunities are largely determined by industrial conditions, our instructors and alumni are always alert in assisting graduates to obtain positions and to make professional advancement.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	2	2	English, 1	2	2
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
History, 2	1	1	Rhetoric and Oratory, 2	1	1
Rhetoric and Oratory, 2	1	1	Mathematics, 3, 4	4	4
Mathematics, 2	4	4	Civil Engineering, 14	2	1
Civil Engineering, 14	2	1	Chemistry, 1	3	3
Chemistry, 1	3	3	Mechanical Engineering, 20	2	2
Mechanical Engineering, 20	2	2	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 40	3	1.5
Mechanical Engineering, 40	3	1.5	Military Science, 1	3	2
Military Science, 1	3	2	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Mathematics, 10	3	3	Chemistry, 4	3	1.5
Chemistry, 3	3	1.5	Physics, 1	3	3
Physics, 1	3	3	Physics, 3	2	1
Physics, 3	2	1	Civil Engineering, 15	2	2
Civil Engineering, 15	2	2	Civil Engineering, 15	2	1
Civil Engineering, 15	2	1	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 22	3	1.5	Military Science, 2	3	2
Military Science, 2	3	2	Physical Training, 2	1	0.5
Physical Training, 2	1	0.5			

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Mineralogy, 1	3	3	Mineralogy, 2	3	3
Bacteriology, 2	1	1	Bacteriology, 2	1	1
Civil Engineering, 6	3	3	Civil Engineering, 8	2	2
Civil Engineering, 2	2	1	Civil Engineering, 7a	3	3
Civil Engineering, 16	2	2	Civil Engineering, 2	2	1
Electrical Engineering, 11	2	2	Mechanical Engineering, 1	3	3
Civil Engineering, 16	3	1.5	Civil Engineering, 16	3	1.5
Military Science, 3	3	2	Civil Engineering, 16	2	2
			Military Science, 3	3	2

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	Civil Engineering, 12	3	3
Civil Engineering, 3	4	4	Civil Engineering, 3	4	4
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Civil Engineering, 5	3	3	Civil Engineering, 5	2	2
Civil Engineering, 9a	4	4	Civil Engineering, 9a	4	4
Civil Engineering, 13	3	1.5	Civil Engineering, 13	3	1.5
Civil Engineering, 1			Civil Engineering, 1		
Military Science, 4	3	2	Military Science, 4	3	2
Options—One to be taken			*Options—One to be taken*		
Civil Engineering, 7a, 7b, 7c	5	3.5	Civil Engineering, 7a, 7b, 7c	5	3.5
Civil Engineering, 11	3	3	Civil Engineering, 10	3	3
			Elective		
			English, 7	1	1

MECHANICAL AND ELECTRICAL ENGINEERING

This department offers two courses, one in Mechanical Engineering and one in Electrical Engineering, each leading to the degree of Bachelor of Science. The courses are designed to teach the principles of Mechanical and Electrical Engineering and to train young men to meet successfully the problems which an engineer may encounter. Besides offering instruction in purely technical studies, the courses also provide the elements of a liberal education, including the subjects of English Composition and Literature, History, Public Speaking, French or German, Mathematics, Physics, and Chemistry.

Both courses are the same for the first three years. During the fourth year, students who take one course or the other pursue separately the subjects pertaining to their particular course. Many studies, however, remain common to both courses.

The department has a well equipped wood-working and machine shop and mechanical and electrical laboratories provided with a variety of machines and apparatus.

The courses are planned so as to combine theory and practice; hence considerable time is spent in the laboratories and drafting room. Furthermore, besides the regular afternoon periods of shopwork, there is a supplementary term in Sophomore shopwork, which will begin on June 10, 1915, and will last for two weeks.

Students are charged a moderate fee for shop and laboratory courses, which fee is intended to cover the cost of materials used and to meet incidental expenses.

Students are required to furnish all instruments and materials used in the drafting-room. The materials must conform strictly to the requirements of the department, and the instruments must meet with the approval of the instructor.

Every candidate for graduation is required to present a satisfactory thesis which shall embody the results of some investigation which he has personally made. These

theses must be typewritten and must be accompanied by such drawings and other sheets as are necessary to illustrate and explain the subject. The theses must be approved by the English Department before they will be accepted.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	2	2	English, 1	2	2
History, 2	1	1	Modern Language, 1 or 10	3	3
Modern Language, 1 or 10	3	3	Rhetoric and Oratory, 2	1	1
Rhetoric and Oratory, 2	1	1	Mathematics, 3 and 4	4	4
Mathematics, 2	4	4	Chemistry, 1	3	3
Chemistry, 1	3	3	Civil Engineering, 14	2	1
Civil Engineering, 14	2	1	Mechanical Engineering, 20	2	2
Mechanical Engineering, 20	2	2	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 40	3	1.5
Mechanical Engineering, 40	3	1.5	Military Science, 1	3	2
Military Science, 1	3	2	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Mathematics, 10	3	3	Physics, 1	3	3
Physics, 1	3	3	Physics, 3	2	1
Physics, 3	2	1	Chemistry, 4	3	1.5
Chemistry, 3	3	1.5	Electrical Engineering, 9	2	2
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 41	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 43		3	Mechanical Engineering, 41	3	1.5
Military Science, 2	3	2	Military Science, 2	3	2
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Civil Engineering, 2	2	1	Mechanical Engineering, 1	3	3
Civil Engineering, 6	3	3	Civil Engineering, 2	2	1
Mechanical Engineering, 24	4	4	Mechanical Engineering, 24	4	4
Electrical Engineering, 1	2	2	Electrical Engineering, 2	2	2
Electrical Engineering, 6	3	1.5	Electrical Engineering, 6	3	1.5
Mechanical Engineering, 42	3	1.5	Mechanical Engineering, 42	3	1.5
Military Science, 3	3	2	Military Science, 3	3	2

SENIOR YEAR—MECHANICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Mechanical Engineering, 3	2	2	Mechanical Engineering, 3	2	2
Mechanical Engineering, 4	4	4	Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1	Mechanical Engineering, 6	1	1
Mechanical Engineering, 9	1	1	Mechanical Engineering, 9	1	1
Mechanical Engineering, 25	6	3	Mechanical Engineering, 25	6	3
Mechanical Engineering, 30	6	3	Mechanical Engineering, 30	6	3
Electrical Engineering, 10	1	1	Electrical Engineering, 10	1	1
Electrical Engineering, 3	4	4	Electrical Engineering, 3	4	4
Electrical Engineering, 12	3	1.5	Electrical Engineering, 12	3	1.5
Military Science, 4	3	2	Military Science, 4	3	2

SENIOR YEAR—ELECTRICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Mechanical Engineering, 4	4	4	Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1	Mechanical Engineering, 6	1	1
Mechanical Engineering, 31	3	1.5	Mechanical Engineering, 31	3	1.5
Electrical Engineering, 10	1	1	Electrical Engineering, 10	1	1
Electrical Engineering, 3	4	4	Electrical Engineering, 3	4	4
Electrical Engineering, 4	6	3	Electrical Engineering, 4	6	3
Electrical Engineering, 5	1	1	Electrical Engineering, 5	1	1
Electrical Engineering, 7	6	3	Electrical Engineering, 7	6	3
Electrical Engineering, 8	1	1	Electrical Engineering, 8	1	1
Military Science, 4	3	2	Military Science, 4	3	2

CHEMICAL ENGINEERING

The course in Chemical Engineering is designed to give thorough instruction in Chemistry and also in some of the more important engineering branches. In addition to the general instruction in Chemistry it includes special work in chemical analysis, organic preparations, electro-analysis, industrial chemistry, with the analysis of some of the more important materials and products, water analysis, and gas analysis. It also includes such branches of mechanical and electrical engineering as are particularly useful in the management of manufacturing establishments. Aside from its special purpose this course offers an excellent scientific education. Every candidate for graduation will be required to prepare in his Senior year a thesis giving the results of his own investigations of some approved subject. This course leads to the degree of Bachelor of Science in Chemical Engineering.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	2	2	English, 1	2	2
History, 2	1	1	Modern Language, 10	3	3
Modern Language, 10	3	3	Rhetoric and Oratory, 2	1	1
Rhetoric and Oratory, 2	1	1	Mathematics, 3, 4	4	4
Mathematics, 2	1	1	Mechanical Engineering, 20	2	2
Mechanical Engineering, 20	2	2	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 40	3	1.5
Mechanical Engineering, 40	3	1.5	Chemistry, 1	3	3
Chemistry, 1	3	3	Military Science, 1	3	2
Military Science, 1	3	2	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 11	3	3	Modern Language, 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Mathematics, 10	3	3	Physics, 1	3	3
Physics, 1	3	3	Physics, 3	2	1
Physics, 3	2	1	Chemistry, 2	3	3
Chemistry, 2	3	3	Chemistry, 4	3	1.5
Chemistry, 3	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 41	3	1.5	Electrical Engineering, 9	2	2
Mechanical Engineering, 43		3	Military Science, 2	3	2
Military Science, 2	3	2	Physical Training, 2	1	0.5
Physical Training, 2	1	0.5			

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Chemistry, 5	3	3	Chemistry, 5	3	3
Chemistry, 6	3	1.5	Chemistry, 7	6	3
Electrical Engineering, 1	2	2	Mechanical Engineering, 1	3	3
Chemistry, 9	1	1	Electrical Engineering, 2	2	2
Chemistry, 11	3	1.5	Mineralogy, 2	3	3
Mineralogy, 1	3	3	Military Science, 3	3	2
Military Science, 3	3	2			

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Chemistry, 15	3	3	Chemistry, 15	3	3
Chemistry, 8	3	3	Chemistry, 10	12	6
Chemistry, 10	12	6	Chemistry, 12	4	2
Chemistry, 13	2	1	Chemistry, 14	2	1
Chemistry, 14	2	1	Military Science, 4	3	2
Military Science, 4	3	2	*Optionals*		
Optionals			(From non-technical subjects)		3
(From non-technical subjects)		3			

ADVANCED DEGREES

The degree of Master of Arts or Master of Science will be awarded upon the satisfactory completion of a resident course of study in Arts, Science, Agriculture, or Engineering extending over not less than one year. The candidate must have taken his first degree in some college of approved standing and must show by his previous record that he is capable of doing satisfactory work for the advanced degree. At the beginning of the year in which he expects the degree he shall select a major subject and one or two minor subjects and he shall take in these subjects the equivalent of at least 12 hours work. He must also attain a high standard of scholarship.

The examination for the Master's Degree may be oral or written, at the option of the professor in charge. In all cases a meritorious thesis must be submitted in the major subject.

A graduate of any of the courses in Engineering will, after three years of practical and successful work as an Engineer, be entitled to the professional degree of C. E., M. E., E. E., or Ch. E., according to the course he may have pursued. One college year before coming up for the degree the candidate must signify his intention, and also map out a definite and satisfactory course of work. He must in addition submit a satisfactory subject for a thesis. The examination, held at Delaware College, will cover the work mapped out and the thesis.

In exceptional cases students may do the actual work for the Master's Degree **in absentia** under conditions determined by the committee on Graduate Study.

An incidental fee of $10 must be paid by the candidate for a higher degree before he will be admitted to the final examinations.

Two copies of all theses submitted for degrees must be left with the college as its property.

SUBJECTS OF INSTRUCTION

By Departments

In this detailed statement of the subjects of instruction, the number of credit term hours is printed in italics at the end of each course. If the actual hours of recitation, lecture, and laboratory work differ from the credit hours, the number of actual hours is stated immediately before the credit hours.

Two hours of laboratory work are counted as equivalent to one lecture or recitation hour.

Courses are full-year courses, except as especially noted.

AGRONOMY

Professor Grantham and Assistant Professor Lintner

Agronomy is the science of the field, the soil, and its crops.

The soil is studied with reference to its functions as the home of the plant. The fundamental principles of soil management for crop production are especially emphasized. The study of soils presupposes a fair understanding of the principles of physics, chemistry, and plant physiology.

Field crops are studied from the standpoint of the fundamental biological principles underlying growth, adaptation, and improvement of plants. A study is made of the economic and business management of the field and its crops. The study of field crops presupposes a general knowledge of botany.

A field of twenty-five acres devoted to experiments and research work in Agronomy is used to supplement class and laboratory work. At least one visit to representative farms of the State will be required of Juniors and Seniors in Agronomy.

Agr 1 and 2 Cereal Crops. The cultivation, harvesting, and marketing of grain crops. Attention in detail is given to the various methods of production and to the cost.

Varieties and types of grain groups are considered, together with the principles of improvement by selection and breeding. Judging of corn, wheat, oats, etc., and a study of market grades and classification; preservation and testing of field crop seeds. Lectures, recitations, and laboratory work. Freshman year, second term; Sophomore year, first term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

Agr 3 Forage Crops. A study of the various types and varieties of grasses and leguminous crops used for hay and pasture. Special attention is given to cultural methods, propagation, and value of the various plants for feed and soil improvement. Lectures, recitations, and laboratory work. Sophomore year, second term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

Agr 4 Soil Physics. A study of the origin, formation, classification, and function of soils; the relation of soil texture to temperature, air, and moisture, and to plant growth; the effect of methods of tillage and drainage on the physical properties of soils. Lectures, recitations, and laboratory work. Junior year, first term.

PROFESSOR GRANTHAM *Three credit hours*

Agr 5 Soil Fertility. The relation of plant food to the productive capacity of the soil and a study of the methods by which the fertility may be obtained and increased. The ultimate effect of various rotations and of different systems of farming on the fertility of soil. A study of the composition of manures, fertilizers, and amendments, with a comparison of their agricultural and commercial value for different crops. Lectures, recitations, and laboratory work. Junior year, second term.

PROFESSOR GRANTHAM *Three credit hours*

Agr 6 Farm Equipment. Laying out the fields; the location, arrangement, design, construction, and cost of farm buildings, especially barns, granaries, silos, etc.; the adaptability, efficiency, construction, operation, and dura-

bility of field machinery; power machinery including steam and gasoline engines; the different kinds of fences, cost, construction, and durability; construction of roads, walks, and drains. Lectures, recitations, and practice work. Senior year, first term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

Agr 7 Farm Management. This course is designed to summarize the student's agricultural training and experience and apply it to the efficient management of the farm as a whole. The organization of the farm as a business enterprise, its arrangement with reference to size and shape of field; systems of crop and livestock management; the relation of fixed to circulating capital; the relation of labor to income; farm accounts, etc. Required of all agricultural students, and elective to Arts and Science students who have the necessary preparation. Lectures and seminars. Senior year, second term.

PROFESSOR GRANTHAM *Three credit hours*

Agr 8 Plant Breeding. The improvement and breeding of field crops, including the grains, grasses, and legumes; selection; results obtained by various investigators. Lectures; assigned readings; demonstrations and laboratory work. Senior elective, second term.

PROFESSOR GRANTHAM *Two credit hours*

Agr 9 Investigation of Special Soils. The determination of the nature and quantity of the elements of fertility; effect upon various crops of different fertilizers added to soils, as determined by pot culture and pot experiments; systematic study of similar work of experiment stations and investigators. Assigned readings, reviews, and laboratory work. Senior elective, first term.

PROFESSOR GRANTHAM *Three credit hours*

Agr 10 Methods of Field Experimentation. A course designed for students intending to take up experiment station work. Methods of plotting land for soil and crop experiments; check systems; interpretation of results.

The literature of this and other countries pertaining to experimental work will be carefully studied. Senior elective, both terms.

PROFESSOR GRANTHAM *One credit hour*

ANCIENT LANGUAGES AND LITERATURES

PROFESSOR CONOVER

Throughout the course the aim is to enable the student to acquire facility and quickness in reading at sight and familiarity with the ancient order of thought. Word-meaning is fixed by inspecting form, derivation, and comparison with synonyms. The authors are selected with a view to their representative character. The public and private life of the Greeks and Romans and their influence on modern literature and civilization are continually kept before the minds of the students. English derivatives and words kindred to all Indo-European tongues are frequently noted, and the general principles of comparative philology are explained and applied.

In addition to the department library, which contains the Delphini edition of Latin writers, the Attic orators and dramatists, etc., the department of classical philology in the general library is steadily growing. It contains bound volumes of the American Journal of Philology and of the Harvard Studies in Classical Philology. The American Journal of Philology is kept on file in the reading room.

LATIN

AL 1 Cicero, De Senectute and De Amicitia. Ovid, Metamorphoses, etc. Prose Composition.

Three credit hours

AL 2 Livy, 21st or 22d book. Horace, Odes, Epodes, Satires, Epistles. Prose Composition.

Three credit hours

AL 3* Tacitus, Germania and Agricola. Plautus, Captives and Trinummus. Juvenal, Satires.

Three credit hours

*Given in alternate years

AL 4* Seneca, Tragedies or Moral Essays. Terence, Adelphoe and Andria. Quintilian, Books X and XII. Lectures on Latin Literature and Inscriptions.

Three credit hours

GREEK

AL 5 White's First Greek Book. Anabasis, I, II.

Three credit hours

AL 6 Anabasis III, IV, Homer, Iliad, I-III. Herodotus VII, VIII.

Three credit hours

AL 7* Lysias, Orations. Plato, Apology and Crito. Aristophanes, Plutus or Clouds.

Three credit hours

AL 8* Demosthenes, Orations. Lucian, Dialogues. Aeschylus, Prometheus Bound.

Three credit hours

AL 9* Greek Prose Composition.

Two credit hours

AL 10* Greek Testament.

Two credit hours

ANIMAL HUSBANDRY

PROFESSOR HAYWARD AND MR. HILLS

AH 1 Types, Breeds, and Market Classes of Live Stock. A course designed to acquaint the beginner with the types and classes of farm animals; the origin, development, and characteristics of the breeds of horses (draft and light), cattle (beef and dairy), sheep (mutton and wool), and swine (bacon and lard); and the selection and judging of the same. Required of Freshmen. First term, two recitations and two hours laboratory work a week.

PROFESSOR HAYWARD AND MR. HILLS *Three credit hours*

AH 2 Types, Breeds, and Market Classes of Live Stock. A continuation of AH 1. Required of Freshmen.

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*Given in alternate years

Second term, two recitations and two hours laboratory work a week.

PROFESSOR HAYWARD AND MR. HILLS *Three credit hours*

AH 3 Feeding Farm Animals. The principles of animal nutrition; the composition and qualities of feeding materials; and the feeding of horses and sheep. Required of Juniors. First term.

MR. HILLS *Two credit hours*

AH 4 Feeding Farm Animals. A continuation of AH 3, dealing with the feeding of dairy and beef cattle, and fat and bacon swine. Required of Juniors. Second term.

MR. HILLS *Two credit hours*

AH 5 Advanced Judging. The aim of this course is to train students in the selection of desirable sires and breeding females, and for judging at fairs. The men who will represent the college in judging contests will be chosen largely from this class. Elective for Seniors. First term, four laboratory hours a week.

PROFESSOR HAYWARD AND MR. HILLS *Two credit hours*

AH 6 Herd and Stud Book Study. An advanced study of the breeds of live stock, familiarizing the student with detailed history of the breeds, the most noted sires and dams of the breeds, and most successful lines of breeding. Elective for Seniors. First term, four laboratory hours.

PROFESSOR HAYWARD *Two credit hours*

AH 7 Principles of Animal Breeding. A presentation of the more practical phases of heredity, variation, correlation, prepotency and environment, and of their application to the breeding of farm animals. Elective for Seniors. Second term.

PROFESSOR HAYWARD *Two credit hours*

AH 8 Live Stock Management. The care, handling, and management of animals for market, show and

farm purposes. Elective for Seniors. Second term, four laboratory hours.

PROFESSOR HAYWARD AND MR. HILLS *Two credit hours*

AH 9 Feeds and Feeding. This course is designed for students taking the Two Years' Course in Agriculture. Its aim is to give a general view of the practical feeding of farm animals. Required of students in the Two Years' Course. Second year, first term.

MR. HILLS *Three credit hours*

BACTERIOLOGY AND HYGIENE

PROFESSOR REED

Ba 1 Bacteriology. Instruction in this subject will be given in the form of lectures, recitations, and laboratory work, and will cover the morphology, biological characters, distribution and classification of bacteria, and the relation of bacteria to animal and plant life. In the laboratory the student will be instructed in the technique necessary for practical work in bacteriology, cleaning and sterilizing apparatus, making culture media, isolating and studying bacteria in cultures and under the microscope both in the living condition and in stained preparations. Both saprophytic and pathogenic organisms will be studied. Required of Juniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

Three credit hours

Ba 2 Hygiene. Instruction in this subject will be given by means of lectures and laboratory work, and will cover the principles of sanitation, the prevention of epidemics, and disinfection. Required of juniors in Civil Engineering and elective for Juniors and Seniors in Arts and Science.

One credit hour

Ba 3 Animal Hygiene. The object of this course is to study the methods of preserving the health of farm animals. Instruction in this subject will consist of lec-

tures, recitations, and demonstrations. Required of Seniors in Agriculture. Second term.

Three credit hours

Ba 4 Bacteriology. This course is for students taking the two years' course in agriculture. The relation of bacteria to animal and plant life and the principles of sterilization and disinfection will be emphasized. Second year, first term.

Two credit hours

Ba 5 Bacteriology. A research course. Laboratory work. Open to students who have taken Bacteriology 1.

Three to five credit hours

BIOLOGY

PROFESSOR HOUGHTON

The aim of biological instruction is to give the student some knowledge of the various living things by which he is surrounded, as well as to develop habits of careful observation and comparison, and close and accurate methods of thinking.

Most of the time is spent in actual study in the laboratory, which is supplied with simple and compound microscopes, microtomes, reagents, etc. There is also an excellent collection of illustrative specimens and charts.

B 1 Elementary Zoology. A study of the variations in the structure and life history of the different classes of animals, their habits and relations. The student secures a general knowledge of the principles of classification based upon the evolution of the animal kingdom, and the principles of Zoology. Selected types of the principal groups of animals from Protozoa to Mammalia, of which dissections, drawings, and notes are required, are studied in the laboratory. The course gives a comprehensive view of the science of Zoology to the student taking no further work, and forms a basis for advanced work. One recitation or lecture and four hours laboratory work a week.

Three credit hours

B 2 Systematic and Economic Zoology. (Prerequisite: B 1). In this course the student becomes acquainted with a large number of our common vertebrates and learns something of their structure, life histories, habits, and economic importance. Much attention is given to the work of tracing typical specimens, representing as many groups as possible, of Fishes, Batrachians, Reptiles, Birds, and Mammals, by means of keys which are based largely upon structural characters. Thus the student gains a clear idea of the relations of forms and the characters upon which classifications are based. Dissections are made when necessary to understand and properly use the keys. Four hours laboratory work a week.

Two credit hours

B 3 Economic Entomology. Lectures, recitations, reports, and occasional laboratory work on the injurious insects of orchard, garden, and field crops. An account of the external and internal anatomy of insects will be given; also of their life histories, their injuries to the various crops, and the means of holding them in control. Specimens of insects under consideration will be placed before the class for examination. Students whose time will permit may take special laboratory work in structure and classification of insects. Two recitations a week.

Two credit hours

B 4 General Botany. As is indicated by its title, this is a general course in botany which aims to give the student a comprehensive idea of the subject as a whole. The topics to which particular attention is given in the first term are as follows: seeds and seedlings; roots, stems, and leaves; the morphology, evolution, and taxonomy of the Thallophyta, Bryophta, and Pteridophyta. In the second term the principal topics are as follows: the Gymnospermae; winter buds; the flower of the higher seed plants, the fruit; the morphology and taxonomy of the Angiospermae; ecology and economic botany. One recitation or lecture and four hours laboratory work a week.

Three credit hours

B 5 Plant Pathology. (Prerequisite: B 4). This is an elementary course in plant pathology, covering the principal bacterial and fungous diseases of our more important economic plants, with methods of control. An effort is made to have the course as practical as possible, special emphasis being placed upon the ability of the student to recognize or determine important plant diseases. Some attention is also given to culture methods and technique. Four hours laboratory work a week.

Two credit hours

CHEMISTRY

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

For students not seeking special preparation in chemistry, courses are offered in inorganic and organic chemistry, qualitative and quantitative analysis, and agricultural chemistry.

The instruction is given in lectures with experiments and by means of laboratory work. The time given to the subject and the courses taken vary with the general course of study pursued by the individual student.

A library of the standard works and a file of the principal journals are accessible to students.

C 1 Inorganic Chemistry. This course treats of the elements and their more important compounds with special reference to industrial uses. Recitations and lectures.

PROFESSOR PENNY *Three credit hours*

C 2 Organic Chemistry. (Prerequisite: Chem. 1). This course treats of the more important carbon compounds. Recitations and lectures.

PROFESSOR PENNY *Three credit hours*

C 3 Introductory Qualitative Analysis. (Prerequisite: Chem. 1). This course is devoted chiefly to laboratory practice in the detection and separation of bases and acids. First term, three hours.

ASSISTANT PROFESSOR TIFFANY *One and a half credit hours*

C 4 Introductory Quantitative Analysis. (Prerequisites: Chem. 1 and 3). This course consists of laboratory work. After preliminary practice, such branches of analysis are studied as are thought to be best adapted to the needs of each student. Second term, three hours.

ASSISTANT PROFESSOR TIFFANY *One and a half credit hours*

C 5 Agricultural Chemistry. (Prequisites: Chem. 1 and 2). This course treats of the chemistry of plant life, of soils, of fertilizers, of feeding stuffs, and of spray materials. Lectures.

PROFESSOR PENNY *Three credit hours*

C 6 Qualitative Analysis. (Prerequisites: Chem. 1 and 3). This course is supplementary to Course 3, which is a prerequisite; it is intended for students desiring a more thorough knowledge of the subject. First term, three hours.

ASSISTANT PROFESSOR TIFFANY *One and a half credit hours*

C 7 Quantitative Analysis. (Prerequisites: Chem. 1, 3, 4). This course is supplementary to course 4, which is a prerequisite. It will be adapted as far as possible to the needs of individual students. Six hours.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

C 8 Industrial Chemistry. (Prerequisites: Chem. 1 and 2). This course treats of the chemistry of several of the more important industrial processes. First term.

PROFESSOR PENNY *Three credit hours*

C 9 Chemical Calculations. First term.

PROFESSOR PENNY *One credit hour*

C 10 Technical Analysis. (Prerequisites: Chem. 1, 3, 4). This is a laboratory course intended for special students of Chemistry. It treats of the analysis of industrial materials and products. Twelve hours.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY *Six credit hours*

C 11 Organic Analysis and Organic Preparations. (Prerequisites: Chem. 1, 2, 3, and 4). This is a laboratory

course; it includes elementary organic analysis and the preparation of some of the more important organic compounds. Three hours, first term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY
One and a half credit hours

C 12 Water Analysis. (Prerequisites: Chem. 1, 3, and 4). A laboratory course in the analysis of potable water and of water for industrial uses. Four hours, second term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY
Two credit hours

C 13 Gas Analysis. (Prerequisites: Chem. 1, 2, 3, and 4). A laboratory course in the analysis of illuminating gas, producer gas, and the like. Two hours, first term.
PROFESSOR PENNY *One credit hour*

C 14 Electro-analysis. (Prerequisites: Chem. 1, 3, and 4). A laboratory course in the determination of metals by electrolytic methods. Two hours, second term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY
One credit hour

C 15 Electrochemistry. This course treats of electricity in its relation to chemistry with special application to industrial processes. Recitations and lectures.
Three credit hours

C 16 Thesis. Original work on an approved subject. Senior year.

CIVIL ENGINEERING

PROFESSOR ROBINSON, PROFESSOR SHORT, MR. PRESTON

CE 1 Thesis. Each Senior student in civil engineering must prepare as a thesis, with such drawings as are necessary for its proper elucidation, a written description of some structure, machine, or process which he may have examined or designed. Not later than the first day of May next preceding the date of the student's graduation, the description and drawings, which will be re-

tained by the college, must be presented to the Professor in charge of the course.

CE 2 Graphic Statics. (Prerequisites: Math. 2 and 10). Co-planar forces, concurrent and non-concurrent; friction; center of gravity; moment of inertia; simple trusses; problems. Recitations, lectures, and drawing. Required of Juniors in Engineering except in Chemical Engineering. Two hours a week.

PROFESSOR ROBINSON *One credit hour*

CE 3 Hydromechanics. (Prerequisite: Math. 11). Hydrostatics; flow of water through orifices and tubes; flow in pipes, conduits, and natural channels; hydraulic machinery; pneumatics. Recitations and lectures. Required of Seniors in Engineering except in Chemical Engineering.

PROFESSOR SHORT *Four credit hours*

CE 4 Mechanics of Materials. (Prerequisites: Math. 7 and 11; Physics 1 and 3; C E. 2). Theory of elasticity; simple stresses; strength of pipes and riveted joints; strength and stiffness of beams and of columns and shafts; resilience of materials. Investigation and design. Properties and structural forms of iron and steel. Recitations, lectures, and laboratory. Required of Seniors in Engineering except in Chemical Engineering.

PROFESSOR ROBINSON *Four credit hours*

CE 5 Masonry. (Prerequisites: Math. 11; Physics 1 and 3). Properties of building stones; preparation of natural stone; manufacture of artificial stones; manufacture and use of limes, cements, mortars, and concrete; foundations; superstructures; stability of masonry structures. Recitations, lectures, laboratory, and visits of inspection. Required of Seniors in Civil Engineering.

PROFESSOR ROBINSON
First term, three credit hours; second term, two credit hours

CE 6 Building Construction. (Prerequisites: Math. 10; Physics 1 and 3). Materials and their use in construc-

tion of buildings; paints and varnishes; framing of floors, partitions, and roofs; fire-proofing, mill-work, and tall building construction; sketching; computing quantities and estimating. Recitations, lectures, and visits to structures. Required of Juniors in Engineering except in Chemical Engineering. First term.

PROFESSOR ROBINSON *Three credit hours*

CE 7 Framed Structures. a Algebraic Methods. b Graphic Methods. c Design. (Prerequisites: Math. 7 and 11; CE 2). Lectures on the construction of the common types of trusses; stresses in the common forms of roof and bridge trusses by algebraic methods; stresses in framed structures by graphic method; elementary problems in investigation and design; principles involved and methods employed in designing, constructing, and erecting framed structures. Recitations, lectures, drawing, and visits to bridge works. Required of Juniors in Civil Engineering. Second term.

Three credit hours

Optional with Seniors in Civil Engineering. Five hours.

PROFESSOR ROBINSON *Three and one-half credit hours*

CE 8 Highways. (Prerequisite: CE 15). Location, construction, and maintenance of roads, streets, and pavements, including study of tractive forces and of the properties of road materials. Recitations and lectures. Required of Juniors in Civil Engineering. Second term.

PROFESSOR SHORT *Two credit hours*

CE 9 Railroads. a Theory. b Practice. (Prerequisites: Math. 2; CE 15 and 16). Reconnaissance, preliminary and location surveys, curves, slope-stakes, earthwork and structures; track-work, maintenance, operation; economic theory of location. Recitations, lectures, field-work, and office-work. Required of Seniors in Civil Engineering.

PROFESSOR ROBINSON *Four credit hours*

CE 10 Water Supply. Requisites of a supply; source; construction and maintenance of systems for collecting, storing, purifying, and distributing water. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering. Second term.

PROFESSOR SHORT *Three credit hours*

CE 11 Sewerage. Different systems for the removal of sewage; design, construction, and maintenance of sewers; individual sewers; sewer appurtenances; disposal and utilization of sewage. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering. First term.

PROFESSOR SHORT *Three credit hours*

CE 12 Contracts. Specifications. Business Law. Contracts; specifications; property; negotiable instruments; agency; partnership; insurance; carriers. Recitations and lectures. Required of Seniors in Civil Engineering. Second term.

PROFESSOR ROBINSON *Three credit hours*

CE 13 Engineering Laboratory. Study of Construction and use of testing apparatus, including testing machines and attachments; examinations and tests of structural materials; discussion of results; preparation of reports. Required of Seniors in Civil Engineering. Three hours.

PROFESSOR ROBINSON *One and one-half credit hours*

CE 14 Surveying. Study of the compass, transit, and level, their uses and adjustments; use of chain in land surveys; computations in land surveys. Recitations and field work. Required of Freshmen in Engineering except in Chemical Engineering. Two hours.

MR. PRESTON *One credit hour*

CE 15 Surveying. (Prerequisite: CE 14). Principles; problems; use of chain, compass, level, and transit; theory of construction and use of instruments; land surveying with transit; survey of public lands of the United

States; topographical surveying; city, hydrographic, and mine surveying; functions of the surveyor; principles for guidance in original surveys and resurveys; adjustment of observations by method of least squares; theory of construction and use of barometer; plotting and computations from students' own field-notes, involving use of various office instruments. Recitations, lectures, field-work, and office-work. Required of Sophomores in Civil Engineering. Four hours.

PROFESSOR SHORT *Three credit hours*

CE 16 Surveying. (Prerequisite: CE 15). Circular curves; theory and use of stadia; plane table topographical surveying and drawing; computation of earthwork; setting slope-stakes; complete topographical survey of a tract of land and location of an industrial spur track; mapping; mathematical astronomy for field use; determination of latitude, azimuth, time, and longitude; use of sextant and solar transit,—day and night observations. Recitations, lectures, field-work, and office-work. Required of Juniors in Civil Engineering. Five hours.

MR. PRESTON *Three and one-half credit hours*

DAIRYING

PROFESSOR HAYWARD AND MR. HILLS

The work in dairying is confined very largely to the production of market milk, milk inspection, home butter making, and milk testing. The equipment for this work consists of an excellent herd of dairy cattle, and a modern well equipped farm dairy. Observation trips will be made to some of the certified milk dairies in the vicinity of Philadelphia.

D 1 This course of study will include lectures on the production, care, and sale of high class market milk, farm dairy butter, and dairy inspection. A practice course in milk testing, separating, etc., will be required of each student. Elective for Seniors. Second term, three hours.

Two credit hours

ELECTRICAL ENGINEERING

PROFESSOR KOERBER AND MR. HILLEGASS

EE 1 Direct Currents. Theory of the direct current dynamo; shunt, series, and compound wound field magnets; ring and drum windings; commutators; direct current motors. **Junior year, first term.**

MR. HILLEGASS *Two credit hours*

EE 2 Direct Currents. Operation, regulation, and methods of testing dynamos and motors. Study of motor and dynamo characteristics. **Junior year, second term.**

MR. HILLEGASS *Two credit hours*

EE 3 Alternating Currents. Inductance and capacity; harmonic electromotive force; single phase and polyphase circuits; alternating current instruments and machinery. Theory of single phase and polyphase induction motors; induction generators; synchronous motors and converters; and single phase commutator motors. **Senior year, first and second terms.**

PROFESSOR KOERBER *Four credit hours*

EE 4 Electrical Design. The calculation, design, and construction of direct and alternating current machinery. Senior year, first and second terms. Six hours a week.

PROFESSOR KOERBER *Three credit hours*

EE 5 Electrical Engineering Seminary. Papers on assigned topics; lectures on recent advances in electrical engineering; discussion of thesis work; discussion of articles in current engineering periodicals. **Senior year, first and second terms.**

PROFESSOR KOERBER *One credit hour*

EE 6 Electrical Laboratory. Determination of characteristic curves; efficiencies and magnetic leakage of direct current dynamos and motors; life and efficiency tests of arc and incandescent lamps. Junior year, first and second terms. Three hours a week.

PROFESSOR KOERBER *One and one-half credit hours*

EE 7 Electrical Laboratory. Efficiencies and characterictic curves of alternators, synchronous motors, induction motors, and transformers. Senior year, first and second terms. Six hours a week.

PROFESSOR KOERBER *Three credit hours*

EE 8 Telephones and Telegraphs. A study of modern telephone systems with a review of the earlier systems and developments. Senior year, first and second terms.

MR. HILLEGASS *One credit hour*

EE 9 Electricity and Magnetism. Fundamental principles of electricity and magnetism. Course for Sophomores, preceding EE 1. Second term.

MR. HILLEGASS *Two credit hours*

EE 10 Direct Currents. Direct current distribution; calculation of high and low tension lines; electric lamps and photometry; details of outside wiring, with particular reference to the rules and regulations of the National Board of Fire Underwriters. Senior year, first and second terms.

PROFESSOR KOERBER *One credit hour*

EE 11 Direct Currents. Theory and application of electrical machinery. For Civil Engineers. Junior year, first term.

MR. HILLEGASS *Two credit hours*

EE 12 Electrical Laboratory. Testing of alternating current machinery and apparatus. For Mechanical Engineers. Senior year, first and second terms. Three hours a week.

MR. HILLEGASS *One and one-half credit hours*

ENGLISH

PROFESSOR SYPHERD AND ASSISTANT PROFESSOR DUTTON

The courses in the English Department are designed (1) to enable every student at graduation to express his ideas in accurate, clear, straightforward English; and (2)

to give to students through required and elective work an acquaintance with the best authors in English and American Literature and an appreciation of good poetry and prose. All students are required to take Composition in the Freshman year, and Literature in the Sophomore year. Students in Arts and Science must take a three-hour course in Composition and Literature in the Senior year; students in Engineering and Agriculture must take an additional one-hour course in Composition in the Senior year.

E 1 Rhetoric and Composition. Recitations, written exercises, and conferences. Two short themes a week written out of class, frequent themes written in the class room, and several long themes in exposition and narration are required during the year. All themes are criticised by the instructor and returned to the student to be revised or rewritten. Each student is furthermore required to discuss his work with the instructor in personal conferences. Required of all Freshmen.

PROFESSOR SYPHERD AND ASSISTANT PROFESSOR DUTTON *Two credit hours*

E 2 Literature. General Survey. Lectures, recitations, and conferences. An attempt is made to give to students an acquaintance with the chief works in English Literature from Beowulf to Tennyson. The connection of the literature with the life of the time is also dwelt on. Much outside reading is required and more suggested, and memory passages are assigned. Required of all Sophomores.

ASSISTANT PROFESSOR DUTTON *Two credit hours*

E 4 Literature. Nineteenth Century. A study of three representative writers of the Victorian Age—Browning, Carlyle, George Eliot. Elective for Sophomores and Juniors, and, with the consent of the instructor, for Seniors.

PROFESSOR SYPHERD *Three credit hours*

E 5 Literature. Chaucer and Shakspere. A critical and appreciative study of some of the Canterbury Tales

and other poems of Chaucer, first term; a critical study of one of Shakspere's plays, accompanied by a rapid reading of several other plays, second term. Elective for Juniors and Seniors, and, with the consent of the instructor, for Sophomores.

PROFESSOR SYPHERD AND ASSISTANT PROFESSOR DUTTON
Three credit hours

E 6 American Literature. The aim of this course is to make a general study of the most important works of American writers from the period of the Revolution down to the present time, and a critical study of a few of the best known works of Irving, Hawthorne, Poe, and others. A careful study of the connection between the literature and the life of the time is also made. Considerable outside reading is required and more suggested, and memory passages are assigned. Lectures, recitations, and reports. Elective for Sophomores and Juniors. [Omitted in 1915-1916.]

ASSISTANT PROFESSOR DUTTON *Three credit hours*

E 7 Composition. Technical English for Engineers. In this course, students have practice in the writing of business letters, reports, instructions, orders, specifications and contracts, and general engineering papers. Required of Seniors in Engineering.

PROFESSOR SYPHERD *One credit hour*

E 8 Composition. An advanced course in writing open to Sophomores and Juniors. This course is designed for students who desire further practice in narrative, expository, and argumentative writing. Special attention will be given to journalistic writing. Themes, reports, and conferences.

ASSISTANT PROFESSOR DUTTON *Two credit hours*

E 9 Composition and Literature. A study of the English essay, with abundant exercises in expository writing, first term; a study of the short story in English, with exercises in narrative writing, second term. Required of

Seniors in Arts and Science. With the permission of the instructor, this course may be taken in the Junior year.
PROFESSOR SYPHERD *Three credit hours*

E 10 Composition. This course is designed to give students in Agriculture training in the planning and phrasing of such papers as they will be called upon to write in connection with the practice of their profession. Required of Seniors in Agriculture, first term; second term, elective.
ASSISTANT PROFESSOR DUTTON *One credit hour*

E 11 Literature. The English drama from the death of Shakspere to the present time. Special attention will be given to contemporary dramatists, such as Pinero, Jones, Shaw, and Stephen Phillips. Lectures, outside reading, reports, and practice in dramatic writing. Elective for Juniors and Seniors in Arts and Science. [Omitted in 1915-1916.]
PROFESSOR SYPHERD *Three credit hours*

E 12 Literature. Anglo-Saxon. Elementary course. Elective for Seniors in Arts and Science. Second term.
PROFESSOR SYPHERD *Two credit hours*

HISTORY, POLITICAL SCIENCE, AND ECONOMICS

PROFESSOR VAUGHN

The courses in this Department are arranged in the approximate order in which they should be taken by the student. Several of them are offered only in alternate years; course 4 will alternate with courses 5 and 6; courses 7 and 8, with 9 and 10. In 1915-16 courses 5, 6, and 9 and 10 will be given. Courses 11 and 12 may upon permission of the instructor be taken for the two years in succession. In all work as outlined an attempt is made not only to afford general information and culture but also to give practical training in citizenship. It is believed that these courses are essential to those who are looking forward to a career in one of the professions.

H 1 History of Western Europe. An introductory course dealing with the history of Western Europe during the mediaeval and modern periods, with special reference to the leading institutions, significant events, and dominant personalities of the successive epochs. Required of Freshmen in Arts and Science.

Three credit hours

H 2 History and Government of Delaware. The aim of this course is to give a general view of the history of Delaware as colony and state, and also to outline the main features of its government. Required of Freshmen in Engineering and Agriculture. First term.

One credit hour

H 3 History of the United States. A somewhat advanced course in American history, embracing the colonial and Revolutionary periods, early national development, slavery and westward expansion, the civil war and reconstruction,and recent developments. A portion of the time will be given to Delaware history in relation to these movements. Required of Sophomores in Arts and Science.

Three credit hours

H 4 History of England. A general study of the development of the English people—political, social, institutional, and literary—from the earliest times to the present day. Such topics as economic history, the rise of democracy, and the growth of empire, call for special emphasis. Elective for Juniors and Seniors in Arts and Science. [Omitted in 1915-1916.]

Three credit hours

H 5 Europe since 1815. An explanation of existing conditions in Europe through the study of the chief phases of its political, economic, and social history and the extension of European influence into other continents. Recommended to students interested in present-day problems. Elective for Juniors and Seniors in Arts and Science. First term.

Three credit hours

H 6 Practical Sociology. An elementary study of sociological principles and of modern social problems. The course will be a practical and rather searching analysis of present-day society. Among the more important topics considered are the following: the evolution and organization of society, the family, population, immigration, city problems, the labor system, wealth and poverty, crime and its punishment. Elective for Juniors and Seniors in Arts and Science. Second term.

Three credit hours

H 7 Principles of Economics. The purpose of the course is to give the student a knowledge of the fundamental principles of economic science and to furnish a basis for the study of present-day problems. Elective for Juniors and Seniors in Arts and Science. First term. [Omitted in 1915-1916].

Three credit hours

H 8 Economic Problems. The following problems will be considered as thoroughly as time permits: (1) Money, credit, and banking, (2) the tariff, (3) labor problems, (4) monopolies and trusts, (5) socialism, and (6) taxation. Outside reading and reports. Elective for Juniors and Seniors in Arts and Science. Second term. [Omitted in 1915-1916].

Three credit hours

H 9 The American Constitutional System. An analysis of the government of the United States, with a consideration of its fundamental principles and of its relations to the states and territories. Special emphasis will be placed upon constitutional questions and decisions. Elective for Juniors and Seniors in Arts and Science. First term.

Three credit hours

H 10 Political Parties and Practical Politics. A sketch of American party history and of the development and operations of party machinery, together with a study of certain party problems in their relation to governmental efficiency and political morality. Practical prob-

lems, such as the caucus, the convention, the boss, the primary, the civil service, etc., call for special consideration. Elective for Juniors and Seniors in Arts and Science. Second term.

Three credit hours

H 11 Studies in Delaware History. An advanced course which offers opportunity to develop special topics in the social, economic, and political history of the State. The aim is partly information and partly training in research work. Elective for Juniors and Seniors in Arts and Science. First term.

Two or three credit hours

H 12 Research Course. A special course in methods of reading and research work, designed especially for those working up theses or essays for graduation and the various contests of the year. The student may select his topics for investigation from any of the fields of work outlined above—history, economics, sociology, government. Elective for Juniors and Seniors in Arts and Science.

One credit hour

HORTICULTURE

PROFESSOR MCCUE AND MR. PAILTHORPE

The aim of the Horticultural Department is to present the various phases of horticulture to the student during the first three years of his course. Several electives are offered for those who desire to elect horticulture during their Senior year.

The college is very favorably situated as regards easy access to the fruit and truck growing centers of the State. Many famous fruit and vegetable growing districts in neighboring states are distant but a few hours' ride. The cold storage houses and the large markets of Philadelphia can be reached in an hour's time, and a famous greenhouse district of Pennsylvania lies only a few miles north of Newark. The earnest student will have many oppor-

tunities to see the practical growing, harvesting, and marketing of horticultural crops.

The college farm possesses about forty acres of orchards and gardens that are available for student instruction. All the tree, bush, and vine fruits that can be grown in the state are found in the college orchards. About an acre of land is also available for the use of students in truck crops.

Hort 1 Plant Propagation. A course discussing the principles governing the propogation of plants by seeds, buds, grafts, layers, and cuttings. Required of Sophomores in Agriculture, first term, three hours.

MR. PAILTHORPE *Two credit hours*

Hort 2 Vegetable Gardening. (Prerequisite: Hort. 1). A study of the location of vegetable gardens and truck farms. Soil, cultural, and fertilizer requirements of the principal trucking crops. A study of the construction and management of hot beds and cold frames. Each student is required to plan, plant, and cultivate a small garden. Trips of inspection are required. Required of Sophomores in Agriculture. Second term, four hours.

MR. PAILTHORPE *Three credit hours*

Hort 3 Pomology. (Prerequisites: Hort. 1; Biol. 4; C. 1, 2, and 3). A study of the principles and practices underlying successful commercial orcharding. A critical study is made of selection of the site, soil, and nursery stock. A thorough discussion is given of planting, pruning, cultivating, fertilizing, and spraying the various orchard fruits. Various methods of orchard management are considered and particular attention is given to the marketing factor in the business of fruit growing. Numerous trips of inspection are required. Required of Juniors in Agriculture. First and second terms, four hours.

PROFESSOR MCCUE AND MR. PAILTHORPE *Three credit hours*

Hort 4 Genetics. (Prerequisites: Biol. 1 and 4). A brief course discussing the foundation principles and

the various theories of heredity. Required of Seniors in Agriculture and elective for students in Arts and Science who offer the proper prerequisites. First term.

PROFESSOR MCCUE *Three credit hours*

Hort 5 Forestry. (Prerequisite: Biol. 4). A brief introductory course to the subject of Forestry. The course embraces a discussion of the handling of wood lots, care and protection of the forest, forest mensuration, and studies of the forest trees of the U. S. Elective for Seniors in Agriculture. First term.

PROFESSOR MCCUE *Two credit hours*

Hort 6 Landscape Gardening. (Prerequisites: Biol. 4; Hort. 1). This course gives a discussion of the laws of ornamental gardening, planning and making lawns, grouping of trees and shrubbery, and the comparisons between the formal and naturalistic styles of gardening. Elective for Seniors in Agriculture. Second term.

MR. PAILTHORPE *Two credit hours*

Hort 7 Advanced Pomology. (Prerequisites: Biol. 4; Hort. 1 and 3). A continuation of course 3. Elective for Seniors in Agriculture. First term.

PROFESSOR MCCUE *Two credit hours*

Hort 8 Breeding of Horticultural Plants. (Prerequisites: Hort. 1, 2, 3, and 4). A study of the application of the laws of heredity to economic horticulture. Elective for Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Two credit hours*

Hort 9 Forcing Crops. (Prerequisites: Hort. 1 and 2; Biol. 2, 4, and 5). A study of greenhouse crops, both vegetable and floral, and greenhouse construction. Elective for Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Three credit hours*

Hort 10 Small Fruits. (Prerequisites: Hort. 1 and 3). A discussion of the commercial production of straw-

berries, raspberries, blackberries, gooseberries, and currants. Elective for Seniors in Agriculture. Second term.
PROFESSOR MCCUE *One credit hour*

MATHEMATICS

PROFESSOR HARTER, PROFESSOR SHORT, MR. PRESTON, MR. MCAVOY

Four hours a week of pure mathematics are required in all courses in the Freshman year, except in the course in Agriculture where Mathematics is discontinued after the end of the first term.

Occasional lectures are given to show the interdependence of the various branches of mathematics, to illustrate the laws expressed in the formulae obtained, and to impress upon the mind of the student the beauty as well as the usefulness of Mathematics.

M 1 Solid Geometry. First term.
MR. MCAVOY *Two credit hours*

M 2 Plane Trigonometry. Required of all Engineers. First term.
MR. PRESTON *Four credit hours*

M 2a Plane Trigonometry. Required of students in Arts and Science and Agriculture. First term.
PROFESSOR SHORT *Two credit hours*

M 3 Spherical Trigonometry. (Prerequisite: M 2). Second term.
MR. PRESTON *Two credit hours*

M 4 College Algebra, including review of elements. Second term.
MR. PRESTON *Two credit hours*

M 6 Analytic Geometry. (Prerequisite: M 2). First term.
MR. PRESTON *Four credit hours*

M 7 Differential and Integral Calculus. Fundamental principles and applications. Second term.
MR. PRESTON *Four credit hours*

M 8 Applications of the Calculus. (Prerequisite: M 7). Required of Juniors in the Civil, Mechanical, Electrical, and Chemical Engineering courses. Open for election to all other qualified students.

PROFESSOR HARTER *Three credit hours*

M 9 General Astronomy.

PROFESSOR HARTER *Two credit hours*

M 10 Elementary Mechanics. Required of Sophomores in the Civil, Mechanical, Electrical, and Chemical Engineering courses. First term.

PROFESSOR HARTER *Three credit hours*

M 11 Theoretical Mechanics. (Prerequisite: M 7).

PROFESSOR SHORT *Five credit hours*

M 12 A course in Differential Equations. (Prerequisite: M 8). First term.

PROFESSOR HARTER *Two credit hours*

M 13 Theory of Functions. (Prerequisite: M 8). Second term.

PROFESSOR HARTER *Two credit hours*

M 14 Method of Least Squares. (Prerequisite: M 7). First term.

PROFESSOR HARTER *Two credit hours*

M 15 Quaternions. (Prerequisite: M 7). Second term.

PROFESSOR HARTER *Two credit hours*

MECHANICAL ENGINEERING

PROFESSOR M. VANG. SMITH, ASSISTANT PROFESSOR SRAGER, MR. HILLEGASS, AND MR. STRING

ME 1 Elements of Steam Engineering. A general description of engines and boilers; their fundamental principles; detailed description of their parts; the reasons for using various elements of construction; practice in the use of an engineering vocabulary; freehand sketches

of various parts of engines and boilers; problems. Junior year, second term.

MR. HILLEGASS *Three credit hours*

ME 3 Thermodynamics. The fundamental laws of the mechanical theory of heat, and their application to gases, saturated and superheated vapors; the theory of steam, air, and gas engines, and refrigeration machines. Senior year.

PROFESSOR SMITH *Two credit hours*

ME 4 Steam Engines and Boilers. The principles, theory, and construction of the steam engine. The fundamental principles of steam turbines. Power plant auxiliaries. Steam boilers; their principles, design, and construction. Senior year.

PROFESSOR SMITH *Four credit hours*

ME 6 Gas Engines. The theory and principles of the gas engine; its construction and operation; gas producers. Senior year.

PROFESSOR SMITH *One credit hour*

ME 9 Steam Turbines. A further consideration of their theory and construction. A continuation of ME 4, for Mechanical Engineers. Senior year.

PROFESSOR SMITH *One credit hour*

ME 20 Descriptive Geometry. The solution of problems relating to points, lines, planes, and surfaces, with practical applications. Recitations and drawing. Freshman year.

ASSISTANT PROFESSOR SRAGER *Two credit hours*

ME 21 Mechanical Drawing. The care and use of instruments and materials; outlining; principles of outline shading; section lining; projections; lettering; intersection and development of surfaces. Freshman year, three hours a week.

ASSISTANT PROFESSOR SRAGER *One and one-half credit hours*

ME 22 Mechanical Drawing. Free hand sketching; detailed working drawings and assembly drawings; tracing; blue printing; use of handbooks. Sophomore year, three hours a week.

ASSISTANT PROFESSOR SRAGER *One and one-half credit hours*

ME 23 Mechanical Drawing. Extension of course ME 22; drawing from empirical formulas; methods of laying out cams, gear wheels, and other mechanical contrivances. Required of Mechanical and Electrical Engineers. Sophomore year. Second term, three hours a week.

ASSISTANT PROFESSOR SRAGER *One and one-half credit hours*

ME 24 Kinematics. The laws of motion; combinations of pure mechanism; rolling and sliding contact; velocity diagrams; linkwork; cams; pulleys; forms of gear teeth. The general theory of slide valve and link motions. The application of the Zeuner diagram to the design of the principal slide-valve gears. Classroom work and drafting. Junior year.

ASSISTANT PROFESSOR SRAGER *Four credit hours*

ME 25 Machine Design. The principles of the design of machinery; their application to the design of special parts, comprising the calculation of all stresses and the necessary distribution of metal to withstand them; properties and uses of materials; the use of handbooks. Classroom work, lectures, and drafting. Senior year. Six hours a week.

PROFESSOR SMITH *Three credit hours*

ME 30 Experimental Engineering. The methods of measuring power; standardization and calibration of instruments; brake and dynamometer tests; efficiency tests of engines, boilers, steam pumps, blowers, and condensers; tests of gas engines; hydraulic measurements; steam turbine tests; calorific values of fuels; tests of the common constructive materials. Senior year, six hours a week.

PROFESSOR SMITH AND MR. HILLEGASS *Three credit hours*

ME 31 Experimental Engineering. A course similar to ME 30 for Electrical Engineers. Senior year, three hours a week.

PROFESSOR SMITH AND MR. HILLEGASS

One and one-half credit hours

ME 40 Carpentry and Wood Turning. The care and general use of wood-working tools; exercises in carpentry; exercises in wood-turning; practical instruction in firing steam boilers and the operation of steam engines. Freshman year, three hours a week.

MR. STRING *One and one-half credit hours*

ME 41 Metal Work and Forging. Exercises in metal turning, facing, boring, planing, drilling, thread cutting, and milling; the use of metal-working hand tools, chipping, and filing; forging and tool dressing; the construction of machine parts, finishing, and assembling; management of steam engines and boilers. Sophomore year, three hours a week.

MR. STRING *One and one-half credit hours*

ME 42 Pattern Making and Founding. The principles of making simple patterns, core-boxes, and patterns for machine parts; core-making; dry sand moulding and casting. Junior year, three hours a week.

MR. STRING *One and one-half credit hours*

ME 43 Supplementary Term in Shopwork. The work done during this term is the same as that described under ME 41. The term begins the day after Commencement each year and lasts two weeks. The hours for work are from 8.45 a. m. to 4.45 p. m. Sophomore year.

MR. STRING *Three credit hours*

MILITARY SCIENCE AND TACTICS

C. C. HERMAN, JR., U. S. INFANTRY

The main object of the military instruction given at this college is to qualify students to be company officers of infantry, volunteers, or militia.

Graduates of this college may be given an opportunity by the War Department of taking the competitive examination for commissions as Second Lieutenants in the regular army, and their services are in demand as officers in the organizations of native troops in the Philippine Islands.

All students are required to take military instruction. Exemption is granted by the Faculty only for physical disability or under exceptional circumstances, but any student who may be excused from military duty shall be required to select such other work as shall be deemed by the Faculty equivalent to the military work omitted. The great benefit of the exercise thus taken, and the fact that it teaches habits of promptness and obedience, aside from the better fitting of young men for patriotic duty in time of need, give the subject peculiar importance and value.

Three hours per week throughout the year are given to this course. Of this time, one hour per week is devoted to theoretical instruction.

The National Government supplies arms, ammunition, and equipments, and details an officer of the army as instructor.

Each cadet is required to supply himself with the following uniforms; Cadet gray trousers and blouse, gray cap, white gloves, white standing collar and black shoes; khaki blouse, breeches and cap and canvas puttee leggings, and tan shoes; overcoat, dark blue. Arrangements for these are made by the Commandant and each uniform provided must be inspected and approved by him before acceptance. They are well made, neat, and durable. The overcoat, by removing the hood, which is the military feature, makes an ideal college overcoat for students when in civilian clothes. The cost of the uniforms is about, Gray, $14.25, Khaki, $7.25, Overcoat, $15.

The Delaware Daughters of the American Revolution and the friends of the late Lieutenant Churchman have, through the Board of Trustees, established a "Lieutenant Clarke Churchman Memorial Fund," the income from which is to be used for the encouragement of military vir-

tues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in that department.

The Roberts medal is worn by the First Sergeant of the best drilled company and is awarded in annual competition of the companies.

FRESHMAN YEAR

Mil 1 U. S. Infantry Drill Regulations. School of the Soldier. School of the Squad. Guard Manual, Duties of Sentinel, on Post, etc.

SOPHOMORE YEAR

Mil 2 U. S. Infantry Drill Regulations. School of the Company. Guard Manual, Elements of First Aid, etc.

JUNIOR YEAR

Mil 3 U. S. Infantry Drill Regulations. School of the Battalion. Firing Regulations, etc.

SENIOR YEAR

Mil 4 Field Service Regulations. Military Law. Map Reading. Map Making. Company Books. Reports and Returns.

A thesis on a military subject.

Lectures during the year by the Commandant, etc.

The practical instruction throughout the college year for all cadets consists of Infantry Drill, School of the Soldier, School of the Squad, School of the Battalion, Position and Aiming Drill, Bayonet exercise, setting up exercises, and Butts Manual, elements of First Aid to the Injured, Signaling, and Target Practice.

The members of the cadet corps have organized a Rifle Club known as the Delaware College Rifle Club. The college furnishes the ammunition and range for gallery practice. The State of Delaware has given the college permission to use its outdoor range for field practice. Medals are given as prizes for target practice.

The officers are appointed from the Senior class; the Sergeants and the Corporals from the Senior, Junior, and Sophomore classes. Appointment is determined by proficiency and conduct the previous year.

Upon graduation, the names of such students belonging to the class as have shown special aptitude for military service will be reported to the Adjutant General, U. S. Army, and also to the Adjutant General, State of Delaware, who publishes their names in an order.

MINERALOGY AND GEOLOGY

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

Mineralogy is taught by means of recitations and lectures, followed by laboratory work on the determination of the different species of minerals. The course is three hours for one term.

Geology is taught by means of recitations and lectures. The course is three hours for one term.

Mi 1 Mineralogy. This course treats of the physical, morphological, and chemical properties of minerals and specially of the occurrence and recovery of the useful minerals. Recitations and laboratory practice. First term.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

Mi 2 Geology. This course treats of dynamical, structural, and historical geology. Recitations and lectures. Second term.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

MODERN LANGUAGES AND LITERATURES

PROFESSOR E. L. SMITH

French and German are among the required subjects of study, and Spanish and Italian are offered to those who wish to elect them. As may be seen in detail on pages 87

to 89, four years' work in French, five years' work in German, two years' work in Spanish, and two in Italian are offered. With the approval of the Faculty, any year or years of this work may be elected by a student in addition to the amount required in his course.

Courses 1 and 2, or 10 and 11, are required of all students in the Four Year Course in Agriculture, and in Engineering, except in Chemical Engineering, in which, courses 10 and 11 are required. A student in the Course in Arts and Science is required to elect at least two full courses in this department.

The work is so conducted as to give all an opportunity to learn to read the modern languages readily; to understand them when heard; to write them correctly, and so to be able easily to learn to speak them if necessity arises; but the main object is to inspire such a love for these languages and literatures as will be a source of pleasure and intellectual growth. Special attention is given to oral recitation and dictation, in so far as the time allotted to the department permits.

FRENCH

ML 1 Elementary French. Study of French grammar with oral exercises in elementary French composition. Aldrich and Foster, Elementary French. Easy reading of modern French prose and poetry. Rollins, French Reader. Study of French syntax and oral exercises in advanced composition. Koren, French Composition. Talbot, Le Français et sa Patrie. Supplementary reading of drama and fiction.

Three credit hours

ML 2 Advanced French. Study of the seventeenth century dramatists, especially Corneille, Racine, and Moliere. French prose of the seventeenth century. Scientific French.

Three credit hours

ML 3 General Survey of French Literature. Beginning at the sixteenth century. Lectures, translations, collateral reading, and reports.

Three credit hours

ML 4 Nineteenth Century. Philosophy, history, criticism, drama, fiction, and poetry. Chateaubriand, Mme. de Staël, Hugo, Saint-Beuve, Thierry, Merimée, Balzac, Lamartine, Beranger, Musset, Dumas père, Dumas fils, Scribe, Michelet, Thiers, Gautier, Sand, Renan, Taine, Augier, Sardou, Bruntière, Lemaitre, Faguet, Daudet, Flaubert, Zola, Maupassant, France, Loti, Coppée, de Vigny, Rostand. Lectures, collateral reading, and reports.

Three credit hours

SPANISH

ML 5* Elementary Spanish. Study of Spanish grammar. Hills and Ford, A Spanish Grammar. Oral exercises in elementary Spanish composition. Easy reading in modern Spanish prose. Asensi, Victoria. Padre Isla, Gil Blas.

Three credit hours

ML 6 Advanced Spanish. Cervantes, Don Quixote. Oral exercises in Spanish conversation.

Three credit hours

ITALIAN

ML 7* Elementary Italian. Study of Italian grammar with oral exercises in elementary composition. Grandgent, Italian Grammar. Easy reading in modern Italian.

Three credit hours

ML 8 Advanced Italian. Reading of more difficult Italian prose. Dante, La Divina Commedia.

Three credit hours

GERMAN

ML 9 Elementary German. For those who do not present German as an entrance requirement. Study of

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*Given in alternate years

German grammar with oral exercises in elementary German composition. Joynes-Meissner, German Grammar. Bacon, Im Vaterland.

Three credit hours

ML 10 Intermediate German. For those who present German as an entrance requirement. Advanced study of German syntax and oral exercises in advanced composition. Wesselhoeft, German Exercises. Supplementary reading in modern German. Schrakamp, Deutsche Heimat. Reading of more difficult German texts.

Three credit hours

ML 11 Advanced German. Study of scientific German. Wait, German Science Reader. First term. Goethe, Faust. Second term.

Three credit hours

ML 12 German Literature. General survey of German literature. Scherer, History of German Literature. Müller, Selections from German writers.

Three credit hours

ML 13 German Literature. Study of the great writers of the eighteenth and nineteenth centuries.

Three credit hours

ML 14 Practical German. Scientific German to suit the requirements of the advanced student. Correspondence and conversation.

Two credit hours

PHILOSOPHY

PROFESSOR ROWAN

Ph 1 Psychology. This course is begun in the first term and completed in the second term. Text-book: James, Psychology. Advanced Course.

Three credit hours

Ph 2 Ethics. Text-book: Davis, Elements of Ethics. Second term.

Three credit hours

PHYSICAL TRAINING

Mr. McAvoy

It is the desire of the college to encourage some form of exercise on the part of the entire student body. It is believed that for the great majority of college men the best solution for the problem of rational and effectual physical training is to be found in well regulated athletics. The value of gymnastic exercises is recognized as being readily adapted to the meeting of special needs and to the correction of bodily defects.

Special provision has been made for Freshmen and Sophomores. The Department has organized a system of exercises calculated to maintain and develop the physical strength of the student and at the same time prevent any of the evils which might arise from exercises that are too violent. The exercises thus provided for are obligatory upon the two forestated classes, subject to exception by the Physical Director.

For those not incapacitated nothing is more conducive to bodily growth and development than properly regulated athletic contests. Inter-collegiate football games are held in the fall. Basketball and indoor work such as wrestling, boxing, and volley ball are given attention in the winter. Baseball and track work are given special attention in the spring.

By requiring every student to take a certain amount of exercise during the first part of the college course, it is thought that interest will be aroused and a habit of regularity will be established which is essential to his best health and efficiency throughout the remainder of his college course and after-life.

PT 1 Physical Training. Outdoor and indoor exercise. One hour.

One-half credit hour

PT 2 Physical Training. Athletic exercises. One hour.

One-half credit hour

PHYSICS

PROFESSOR HARTER AND PROFESSOR KOERBER

In the arrangement of the work in Physics the wants of all classes of students are carefully considered. Three periods a week throughout the Sophomore year are given to recitations and lectures, in the courses of Civil, Mechanical, Electrical, and Chemical Engineering, and Agriculture. This study is open for election to students in the course of Arts and Science in any year of their course. Besides, Laboratory exercises of two hours a week are required of all who take Physics 1.

A more advanced course dealing chiefly with mechanics and heat is open to students of the Arts and Science course after the completion of the work of Physics 1 and Physics 2.

Ps 1 General Physics. Recitations, lectures, demonstrations.

PROFESSOR HARTER *Three credit hours*

Ps 2 Laboratory Work in Physics. For students in the course of Arts and Science, and Agriculture. Two hours.

PROFESSOR HARTER *One credit hour*

Ps 3 Laboratory Work in Physics. For students in Civil, Mechanical, Electrical, and Chemical Engineering.

PROFESSOR HARTER AND PROFESSOR KOERBER *One credit hour*

Ps 4 Second year in Physics. Lectures, recitations, laboratory work. Four hours.

PROFESSOR HARTER *Three credit hours*

RHETORIC AND ORATORY

PROFESSOR ROWAN

R 1 Required of Freshmen in Arts and Science. Text-book: Cumnock's Choice Readings. Weekly readings and declamations.

One credit hour

R 2 Required of Freshmen in the Engineering Courses. Text-book: Knapp and French, The Speech For Special Occasions.

One credit hour

R 3 Required of Juniors in Agriculture. Text-book: Knapp and French, The Speech For Special Occasions.

One credit hour

R 4 Elective for Seniors except Engineers. Text-book: Laurence, Speech Making.

One credit hour

R 5 Debating. Elective for Arts and Science Students and Seniors in Agriculture. Text-book: Foster, Argumentation and Debating.

One credit hour

SOIL BACTERIOLOGY

PROFESSOR MANNS

SB 1 Soil Bacteriology. (Prerequisites: Bacteriology 1; Chemistry 5). The course consists of a study of the economic importance of the invisible but highly active soil organisms. These organisms, the bacteria, fungi, and protozoa, have been shown in recent years to play an active part in soil fertility. A study will be made of their work in relation to ammonification, nitrification, and denitrification; the influence of cropping and tillage on the flora; the economic use of fertilizers and lime; bacteria in relation to the fixation of nitrogen by legumes; sick soils due to parasitic bacteria and fungi.

The laboratory work will consist in a quantitative and qualitative study of the types of flora, i. e., the ammonifiers, nitrifiers, nodule organisms, and some parasitic fungi from sick soils; measuring the rate of nitrification, fixation of atmospheric nitrogen, and ammonification in different soils variously manured, fertilization and limed. Required of Seniors in agriculture. Second term, one hour lecture, four hours laboratory.

Three credit hours

GENERAL INFORMATION

EXPENSES

Tuition

Tuition is free to students from the State of Delaware. The tuition for all other students is $25 a year.

Fees

	First Term	*Second Term*
INCIDENTAL EXPENSES	$20.25	$20.25
Use of Library		
Use of Gymnasium		
Athletics		
Ordinary "wear and tear"		
LABORATORY		
Shop		
Freshman year	3.75	3.75
Sophomore year	5.25	5.25
Junior year	3.75	3.75
Chemistry	7.50	7.50
Zoology	1.25	1.25
Botany	1.25	1.25
Bacteriology	2.50	2.50
Electrical Engineering		
Junior year	6.00	6.00
Senior year	6.00	6.00

MATRICULATION

A fee of $5.00 is charged to each student on entering college. This fee is collected but once.

Military Uniform

Gray Suit	14.25	
Khaki		7.25
Overcoat	15.00	

Room and Board

Rooms may be obtained in the town from $1.50 a week up (two in a room).

Board in the Students' Association costs approximately $4.00 a week, or, for the year of 36 weeks, approximately $144. Board in the town ranges from $4.00 to $5.50 a week.

Estimated Total Expenses

The usual expenses for the year of a Freshman from the State of Delaware who boards in Newark may be estimated approximately as follows:

Matriculation	$ 5.00
Incidental expenses	40.50
Military uniforms, including overcoat	36.50
Board, 36 weeks at $4.00	144.00
Room, 36 weeks at $1.50	54.00
Books	12.00
Laundry	18.00
Other incidentals (personal expenses)	25.00
Total	$335.00

For a student in Agriculture, $2.50 should be added for charges in Botanical Laboratory. For a student in Engineering, approximately $25 should be added for draughting instruments and Shop charges. For a student coming from another state, $25 should be added for Tuition.

The actual expenses of Freshmen range from a minimum of $160 (including Commuter's ticket from Wilmington) through a mean of $300 to a maximum of $530.

Payments

The matriculation fee of $5.00 must be paid at the time of registration.

The college bill for the first term is due and payable at the opening of the college year; the bill for the second term, at the opening of the second term. In order to be admitted to classes and laboratories, students must present to the Instructors in charge the Treasurer's receipt for the payment of the fixed charges of the college.

Registration

Application for admission to college should be made to the Secretary of the Faculty before Tuesday, September 14, 1915. Candidates for admission to the Freshman class are advised to submit their applications and credentials at the time of the Entrance Examinations in June or during the summer preceding the college year in which they wish to enter. Sophomores, Juniors, and Seniors should register on or before Thursday, September 16, 1915.

Advisers

Discipline in the college is directly in charge of a board of advisers. The adviser for the Freshman Class is appointed by the President at the beginning of each academic year. The advisers for the other classes are appointed by the President at the close of each academic year from a list of men chosen by the respective classes. For the academic year 1914-1915, the advisers are: Professor Koerber, Senior; Professor E. L. Smith, Junior; Professor Short, Sophomore; and Professor Sypherd, Freshman.

Attendance

Regular attendance is required at all college exercises. Suitable rules governing absences have been

adopted and any student not observing them will be dropped from the college. Punctual return to the college after vacation or at the beginning of a term is insisted upon. All absences immediately preceding or following a vacation are counted double.

All work missed by reason of necessary absences must be made up to the satisfaction of the professor concerned; otherwise the student will be marked zero for each exercise missed. The privilege of making up work will not be granted after an unexcused absence.

Religious Instruction

The college is in no sense sectarian, but every student is expected to attend public worship at least once each Sunday at such place as parent or guardian may select. All students are required to be present at the daily morning prayer.

Government

Discipline is administered by the Faculty. The government is mild but firm. Sound principles of morality are taught, and sentiments of manliness, honor, and self-respect are impressed upon the students. Misbehavior is reprimanded privately, and for gross disorder the parent or guardian is requested to remove the offender. Suspension or expulsion is the last resort.

Examinations

Examinations in all subjects are held at the close of each term and are conducted either in writing, or orally, as the nature of the subject may require or as the professor may prefer. Review examinations are also held at other times whenever, in the judgment of the professor, the objects of instruction may be promoted by such means. The examinations are designed not as a mere test of the student's knowledge, but as a valuable training in rapid, concise, and accurate expression. They serve as a valu-

able means of giving the student a ready command of his mental powers, and, by encouraging a review of a period of work, they give him a broader view and a firmer hold of the several subjects of study.

In determining a student's fitness to proceed to a higher class great weight is given to the character of his performance of recitation room duties. The results of the term examinations are combined with the recitation records; but in fixing the student's standing, the quality of his recitation work is the weightier factor.

No student will be promoted unless he has completed three-fourths of the work of his class of the year just passed and has no condition in previous years unsatisfied.

Re-examinations

Students who fail in an examination in any subject are required to pay a fee of one dollar for a re-examination and two dollars for any re-examination thereafter. In order to be admitted to a re-examination students must present to the examiner a certificate properly signed showing that the fee has been paid. The money arising from this source will be expended for books for the general library.

Reports

At the close of each term a report of the student's general combined recitation and examination record will be sent to his parents or guardian. These reports show the course of study the student is pursuing and the class in which he is enrolled. Parents are urged to give these reports close attention, and, when the reports indicate any lack of attention to duty, to co-operate with the Faculty in correcting habits of idleness and indifference.

Student Self-Aid

During the autumn of 1914, the President appointed a committee to secure employment for students who de-

pend on their own resources. This committee endeavors to secure such employment as will interfere least with the regular college work. All students wishing to avail themselves of opportunities thus offered are requested to register with the chairman of the committee, Professor Harold E. Tiffany. The other members of the committee are Mr. H. L. Bonham and Mr. Joseph Weaver, '15.

PRIZES AND SCHOLARSHIPS

The Bishop Coleman Memorial Prize

The Bishop Coleman Memorial Prize of twenty-five dollars is offered annually to the member of the graduating class having in all respects the best standing in the Senior year.

The Alumni Prizes

To encourage literary work among the students, the Alumni Association offers two prizes of thirty dollars and twenty dollars respectively to the best and second best debaters in an annual contest. The winner of any one of the prizes is not eligible to contest for that prize again.

Lieutenant Clarke Churchman Memorial Prize

The Delaware Daughters of the American Revolution and friends of Lieutenant Clarke Churchman have established a "Lieutenant Clarke Churchman Memorial Fund," the income from which is to be used for the encouragement of military virtues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in the military department. The prize derived from this fund amounts annually to twenty-five or thirty dollars.

The Freshman English Prize

A prize of twenty-five dollars is offered by Clifford Stelle, Jr., class of 1911, to the student who attains the highest standing in English 1 (Freshman Composition).

The Philo Sherman Bennett Prize

The Hon. William Jennings Bryan, in carrying out the will of Philo Sherman Bennett, Esq., late of New Haven, Connecticut, has designated Delaware College as one of the twenty-five colleges or universities to receive its share of an endowment of ten thousand dollars to be invested and the proceeds to be applied to the payment of an annual prize "for the best essay discussing the principles of free government." Delaware College has accordingly received four hundred dollars in trust for this purpose, and from the income derived from this sum an annual prize will be awarded to the undergraduate student who presents the best essay in the fields prescribed. The income from this fund yields an annual prize of twenty to twenty-five dollars.

The W. C. T. U. Prize

The Women's Christian Temperance Union offers annually two prizes in Oratory and Composition to be open to all undergraduate students of the College. The contestants have a wide range of subjects from which to choose, the only restriction imposed being that they shall be from the entire field of Scientific Temperance. The first prize for 1915 is thirty-five dollars and the second prize is fifteen dollars.

The William D. Clark Prize for Mathematics

The late Miss Julia Newton Clark, in memory of her father, William D. Clark, offered a prize of twenty-five dollars to be awarded at the end of the Sophomore year to the student who had shown the greatest proficiency in Mathematics during his Freshman and Sophomore years.

Since her death this prize has been given by Miss Emma Clark.

Trustee Prize

A prize of fifty dollars is offered by a Trustee to the Junior who, during the first three years of his course, has maintained the highest general average of proficiency in all college activities, such as The Review, Literary Society, Y. M. C. A., the Agricultural Club, Athletics, Orchestra, and Courses of Study.

Only those students who have spent three years in residence at Delaware College will be considered.

The State Grange Prizes

For the purpose of encouraging a high standard of work in the Agricultural courses, the Delaware State Grange has offered three cash prizes of fifteen dollars, ten dollars, and five dollars in gold to be awarded respectively to the three students pursuing either the four years' or the two years' course in Agriculture who have manifested the greatest interest, and made the greatest progress in their work during the year for which the prizes are awarded.

The Francis A. Cooch Botanical Prize

A prize of fifteen dollars is offered by Mr. Francis A. Cooch, '93, to the student making the best collection of flowering plants, ferns, and their allies, found growing in the State of Delaware.

Henry Ridgely Prizes

Through the kindness of Henry Ridgely, Esq., of Dover, two prizes in the field of Delaware history are offered for the year 1914-1915. These prizes, $35 and $15 respectively, will be awarded on Commencement Day to the students in the Department of History and Economics

presenting the best two theses on some phase of the history, government, or economic development of the State. The competition will be governed by rules similar to those posted each year for the Bennett prize in government.

Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware

A scholarship amounting to $100 annually was founded in 1914 by the Harvard, Princeton, and Yale Clubs of Delaware. It will be awarded to a deserving Delaware boy. The appointment is made for one year only, but the incumbent for any one year may be reappointed.

LIBRARIES

The combined libraries of the college contain about 20,500 volumes. About 1000 volumes were added during the past year.

Each department of instruction has its own library of reference works in its classroom or laboratory, under the immediate supervision of the professor in charge, from whom students may obtain books for use in connection with their work.

The general library, in which are most of the books on literature, history, economics, philosophy, etc., is, together with the reading-room, open to students from 8.15 a. m. to 10 p. m.

The library has been designated as one of the depositories for the public documents of the United States Government and from this source receives many valuable publications.

Several friends of the college have made valuable additions to the library by the presentation of books, magazines, and pictures, and further gifts are earnestly desired.

Through the courtesy of the publishers many of our State papers are regularly found on the tables of the Reading Room.

ATHLETICS

General Regulations

Football, baseball, basketball, track athletics, and tennis are recognized as collegiate sports.

The general supervision of all athletic sports is vested in an athletic council composed of two members of the Faculty, two members of the Alumni Association, and three undergraduates, chosen from the three upper classes.

All eligibility rules originate with the Faculty.

Any student who is admitted to college later than the second Monday of a term is not eligible during that term to represent the college in outside athletic contests.

No student is permitted to represent the college on any athletic team or as manager of such, who is not in good standing in his class and doing, at the time, satisfactory work in his studies.

No student pursuing a course other than one leading to a degree will be permitted to represent the college in any athletic contest during his first year in residence, unless he shall have satisfied the entrance requirements of a course leading to a degree.

Buildings and Grounds

A spacious gymnasium containing apparatus for gymnastic exercises, a running track, shower baths, and a swimming pool, affords ample accommodations for indoor athletic sports, such as basketball, indoor-running, swimming contests, wrestling, and boxing.

In Frazer Field, the college possesses one of the best athletic fields in the country. This field, completely equipped, was donated to the college by Mr. and Mrs. Eben

B. Frazer of Newark, and Mr. Stanley Frazer, '04, of New York City, as a memorial to a son and brother, Joseph Heckart Frazer, '03. The field contains a baseball diamond, football gridiron, tennis courts and a quarter-mile cinder track with a 220-yard straightaway. It is enclosed with a hollow tile stucco wall and has a beautiful terrace along one side.

Farmers' Day. The Monday preceding Commencement, June 7, 1915, is Farmers' Day at the College Farm. On this day the college invites the farmers and their wives to spend the day in the study of several hundred experimental plots on the farm, as well as to become familiar with the live stock, orchards, and other equipment that are used for investigation and which may also serve as illustrative material in the classroom.

Special railroad rates will probably be obtained to Newark and return. The college serves lunch to its guests, and speakers of note will discuss some important agricultural questions. Special announcement of these occasions will be made in detail later.

State Chemist. The Professor of Chemistry in the college is by legislative enactment ex officio State Chemist of Delaware.

State Bacteriological and Pathological Laboratory. By Act of the Delaware Legislature, a State Bacteriological and Pathological Laboratory has been established at the college. The Laboratory is under the management of the State Board of Health. Its location makes accessible the resources of the college in the way of libraries and apparatus. It is under the management of Mr. Herbert K. Watson.

ORGANIZATIONS

The Agricultural Club. The Agricultural Club is composed of the agricultural students and some members of the Faculty. It is under the management of the students, who elect their officers each term. Meetings are held weekly and subjects relating to both class work and actual farm practice are discussed. Lecturers of repute address the Club on agricultural subjects. The object of the Club is to create enthusiasm and to promote the interests of agriculture among the students as well as to accustom the members to talk on agricultural subjects before an audience. The officers for 1914-1915 are: L. O. Russell, '15, President; L. G. Mulholland, '16, Vice-President; J. H. Salevan, '16, Secretary; A. B. Thomas, '16, Treasurer.

Alumni Association. Membership in the general alumni association is limited to graduates, to men who have completed the two years' course in Agriculture, and to other former students who may be elected by the association. The officers for 1914-1915 are: Victor B. Woolley, '85, President; H. Rodney Sharp, '00, Vice-President; Egmont Horn, '10, Secretary; C. A. Short, '96, Treasurer.

The Arts and Science Club. The Arts and Science Club, which was organized in 1913, is composed of those members of the Faculty who teach students in the Arts and Science Course. Its aim is to promote social intercourse among the members of the Faculty; to advance the interests of the general academic work; and to promote the welfare of the college. The executive committee for 1914-1915 is as follows: Professor Vaughn, chairman, Professor Short, Professor E. L. Smith, and Professor Sypherd.

Athletic Association. The Athletic Association is a student organization which takes charge of details of athletic affairs not controlled directly by the Athletic Council. The officers for 1914-1915 are: H. J. Little, '15, President; W. L. Torbert, '15, Vice-President; H. L. Manning, '16, Secretary.

Athletic Council. The Athletic Council is in direct charge of all athletic activities not constituting a part of the college curriculum. It is composed of two representatives from the Faculty, two representatives from the Alumni, and three representatives from the Students, representing respectively the Senior, Junior, and Sophomore classes. The officers for 1914-1915 are: Professor Edw. Laurence Smith, President; Professor Charles A. McCue, Vice-President; Dr. Walt H. Steel, Ex-'95, Treasurer; Joseph M. McVey, '04; G. F. Alderson, '15; G. O. Smith, '16; H. W. Horsey, '17.

Fraternities. Three national Greek letter fraternities have local chapters at the college: Kappa Alpha (Southern), Sigma Nu, and Sigma Phi Epsilon. A fourth organization, Omega Alpha, is local. Three of these fraternities own their houses. The average resident membership is about sixteen.

Literary Societies. Two literary societies, each nearly as old as the College, have been not only important adjuncts to the social life of the institution, but also valuable aids in its educational work. The Athenaean and Delta Phi Societies occupy a place midway between the literary societies of some larger colleges and the Greek letter fraternities now widely extended throughout the college system of the United States. Each society has a comfortable hall in the old College Building, and each has a small but well chosen library of general literature, history, biography, and popular science.

The Athenaean Literary Society was founded December 18, 1834, about six months after the opening of the College. The Society's first constitution was adopted in February, 1835, and the Society was incorporated by Act of the Delaware Legislature, February 11, 1881.

The Delta Phi Literary Society, which claims for itself somewhat greater age than its rival, was legally incorporated January 12, 1835. The Society obtained a new

charter from the Legislature of Delaware about 1871, and another one in 1895.

So excellent is the influence of these organizations that the Faculty earnestly counsels every student to connect himself early in his course with one or the other. The officers of the Athenaean Society for 1914-1915 are: H. L. Brown, President; A. B. Carey, Vice-President; Y. E. Rhodes, Secretary; W. I. Brockson, Treasurer. The officers of the Delta Phi Society for 1914-1915 are: C. D. Pepper, President; W. L. Torbert, Jr., Vice-President; S. D. Loomis, Secretary; J. H. Salevan, Treasurer.

Orchestra. The Orchestra, which was organized in 1913, plays at chapel exercises and gives concerts in Newark and other towns throughout the State. The members for 1914-1915 are:

Director, E. W. Martin, '15

FIRST VIOLINS

E. C. Souder, '14, Concertmeister
W. J. McAvoy
W. R. Miller, '18
J. L. Litz, '18
R. L. Sumwalt, '18
P. G. Swayne, '18

FLUTE

D. A. Price, '15

CLARINETS

T. V. Wingate, '15
H. V. Taylor, '16

FRENCH HORN

W. L. Haley, '16

CORNETS

W. M. Marks, '18
G. C. Brower, '17
A. L. Lauritsen, '18

SECOND VIOLINS

A. G. Heinel, '16
E. W. Seely, '18
H. M. Grieves, '15
L. R. Witsil, '18
E. P. Catts, '18
W. A. Rhodes, '18

VIOLONCELLO

E. W. Densmore, '18

BASS VIOL

F. Groff, '16

TROMBONE

A. B. Carey, '15

PIANO

W. L. Torbert, '15

Phi Kappa Phi. A Chapter of the Phi Kappa Phi, a honorary fraternity devoted to the interests of Scholarship, was established at the college in 1905. Its officers

for 1914-1915 are: Professor M. Van G. Smith, President; Jos. M. McVey, Vice President; Professor E. L. Smith, Secretary and Treasurer.

Young Men's Christian Association. The college Y. M. C. A. is under the management of the students, who annually elect their officers and various committees. The room known as the Y. M. C. A. room is located in the West Wing of the improved college building. It is comfortably and tastefully furnished and always open for the use of all students. The object of the association is to promote Christian fellowship among the students and to furnish to all an opportunity for practical Christian work. Bible classes meet once a week for systematic study of the Bible. These classes are taught by teachers chosen from the association. The Y. M. C. A. is a helpful moral influence in the college life of a student. The officers for 1914-1915 are: Russel Paynter, '15, President; W. I. Brockson, '15, Corresponding Secretary; J. W. Jones, '16, Treasurer; H. W. Bramhall, '16, Recording Secretary.

PUBLICATIONS

The regular publications of the college consist of the Delaware College Review, the Delaware Farmer, the Bulletin, and the Experiment Station Bulletin. The Review and the Delaware Farmer are student publications.

The Review. The Review is a monthly publication devoted to the general interests of the students. The subscription price is fifty cents a year. Its officers for the year are:

YORKE E. RHODES, '15, *Editor-in-Chief*

ASSISTANT EDITORS

H. J. Little, '15 E. C. Souder, '15 E. W. Martin, '16

Associate Editors

W. I. Brockson, '15 W. F. Cann, '15 J. W. Jones, '16
R. Paynter, '15 C. D. Pepper, '16 E. G. Smyth, '17
E. Lacklen, '15 G. O. Smith, '16 G. C. Brower, '17
Herbert Lindsay, '15, *Business Manager*
L. G. Mulholland, '16, *Assistant Business Manager*
L. B. Steele, '17, *Circulation Mnaager*

The Delaware Farmer. The Delaware Farmer is published monthly during the college year by the Agricultural Club of Delaware College. The purpose of The Delaware Farmer is two fold: (1) to publish unbiased scientific facts applicable to the farm practices on the Delmarvia Peninsula; (2) to aid in placing the work of Delaware College before as many people as possible. The subscription price is fifty cents per year. The officers for the year are:

Robert Weimer, *Assistant Editor-in-Chief*
W. I. Brockson, *Editor-in-Chief*

G. O. Smith..*Animal Husbandry*
L. G. Mulholland...*Horticulture*
H. M. Grieves.....*Agronomy*
L. G. Gibney..... *Questions and Answers*
W. C. Newton....*Campus Notes*
A. B. Thomas.....*Grange News*
J. H. Salevan..*Business Manager*
J. A. Hopkins, Jr..... *Assistant Business Manager*
L. O. Russell, *Advertising Manager*
W. B. Seward..... *Circulation Manager*

The **Bulletin** is issued quarterly. One of the four numbers is the Catalogue number. The **Experiment Station Bulletin** is issued quarterly by the Experiment Station. One of the numbers is the Annual Report. These bulletins will be sent to any address.

EXTENSION STAFF AND LECTURES

PRESIDENT S. C. MITCHELL

1 The Making of Modern Italy
2 The Life of Mirabeau
3 The Growth of Community Life

PROFESSOR ELISHA CONOVER

Latin and Greek

1 Private Life of the Romans
2 The Value of Classical Studies

ASSISTANT PROFESSOR G. E. DUTTON

English

1 Walt Whitman the Poet
2 Sidney Lanier
3 Thomas Bailey Aldrich
4 The Spirit of American Literature
5 The Poetry of the American Revolution
6 The Poetry of the Civil War
7 American Lyric Poetry
8 Humor in American Poetry
9 Cowboy Songs and Ballads

PROFESSOR A. E. GRANTHAM

Agronomy

1 Some Tendencies of Rural Life
2 The Farm in Literature
3 The Origin of Our Cultivated Plants
4 Efficiency in Farm Management
5 The Story of Wheat. Illustrated
6 Recent Advances in Agricultural Sciences
7 The Country Gentleman

PROFESSOR G. A. HARTER

Mathematics and Physics

1 The Solar System
2 The Wonders of the Heavens
3 The Physics of the Weather
4 The Physics of the Household
5 Physics in Our Daily Life

PROFESSOR HARRY HAYWARD

Animal Husbandry

1 Our Careers
2 Epoch Makers in Agriculture
3 The Church and Agriculture
4 Some Famous Farm Animals. Illustrated

MR. W. J. McAVOY

Physical Director

1 True Sportsmanship
2 The Value of Play

PROFESSOR C. A. McCUE

Horticulture

1 Life Through Death—Plant Life
2 Across the Painted Desert
3 "The Dooryard"

PROFESSOR T. F. MANNS

Plant Pathology and Soil Bacteriology

1 Our Policy in the Philippines. Illustrated
2 The Relation of Life in the Soil to Agriculture
3 The Seed Potato—Its Vitality and Diseases
4 Plant Diseases and Their Control. Illustrated

MR. M. O. PENCE

Agricultural Agent of Kent County

1 Vocational Education
2 Training Our Farm Boys and Girls

PROFESSOR RAYMOND C. REED

Bacteriology and Hygiene

1 The Romance in Bacteriology
2 Animals as Disease Carriers
3 Milk and Public Health
4 Louis Pasteur

PROFESSOR W. J. ROWAN

Rhetoric and Oratory

1 The Making of the Orator
2 Our Bird Neighbors. Illustrated
3 Alexander the Great
4 The American Revolution
5 Benedict Arnold—A Character Study
6 A Flying Trip through Western Europe

PROFESSOR C. A. SHORT

Mathematics and Engineering

1 Water and Its Purification
2 Road Improvement and Maintenance
3 Rural Sanitation
4 Sewage Disposal—Its Relation to Disease
5 Gold Mining in California
6 The Story of the Stars

PROFESSOR E. L. SMITH

Modern Languages

1 Great French Writers of the Seventeenth Century
2 Victor Hugo
3 Goethe and Schiller
4 Paris. Illustrated
5 Great German Cities
6 Napoleon Bonaparte

ASSISTANT PROFESSOR Z. H. SRAGER

Mechanical and Electrical Engineering

1 Gas Engines and the Farmer

PROFESSOR W. O. SYPHERD

English

1 Literature and Life
2 What Should a High School Student Read?
3 Books and Their Readers
4 Dickens and the Modern Reader
5 Othello as a Representative Shaksperean Tragedy
6 Kipling as a Short-Story Writer
7 Joseph Conrad, a Writer of the Sea
8 Robert Louis Stevenson

MR. J. J. TAUBENHAUS

Assistant Plant Pathologist

1 What are Plant Diseases?
2 The Plant Doctor and His Mission

PROFESSOR FIRMAN THOMPSON

Agricultural Chemistry

1 Under the Southern Cross. Illustrated
2 The Hawaiian Islands. Illustrated
3 Chemistry and Civilization

PROFESSOR E. V. VAUGHN

History and Economics

1 Some Curious Facts in Delaware History
2 Social Life in Colonial Delaware

3 The Real William Penn
4 Our Town—A Typical Community
5 Mrs. Brown and Her Market Basket
6 The Dream of the Socialist
7 Literature and Liberal Culture
8 An Hour with Tennyson
9 A Summer Tour through England
10 By special agreement other topics may be arranged for either as single lectures or as a lecture series.

ASSISTANT PROFESSOR A. C. WHITTIER

Agricultural Chemistry

1 How We Live—Nutrition
2 The Chemistry of Everyday Life

THE WOMEN'S COLLEGE OF DELAWARE

DEAN WINIFRED J. ROBINSON

1 Yellowstone Park. Illustrated
2 The Canadian Rockies

PROFESSOR MYRTLE V. CAUDELL

Home Economics

1 The Art of Home Making
2 Women as Spenders
3 Beneficial Beverages
4 Breads and Bread Making
5 Meats and Meat Substitutes

PROFESSOR MARY E. RICH

Education

1 Rural Recreation
2 Books for Children

For further information regarding these lectures address

Chairman of College Extension
Delaware College, Newark, Delaware

MILITARY ORGANIZATION

COMMANDANT OF CADETS

C. C. Herman, Jr.

1st. Lieut., U. S. Infantry

ASSISTANT TO COMMANDANT

John Frazer

1st. Sergt., U. S. A., retired

CADET OFFICERS

Major, W. F. Cann

Captain and Adjutant
H. H. Adams

1st. Lieut. Battalion and Commissary
H. T. Bennett

NON-COMMISSIONED STAFF

Sergeant Major, H. C. Bounds
Color Sergeant, R. Paynter
Color Sergeant, W. K. Hoch

SIGNAL DETACHMENT

2d Lieutenant, L. J. Owens

PRIVATES

R. M. Cameron
P. J. Kienle
E. R. Woodman

BAND

Chief Musician

L. O. Russell, 1st Lieutenant
Second Lieutenant, H. H. Montgomery
Second Lieutenant, T. V. Wingate

Drum Major

H. J. Little, 2d Lieutenant

SERGEANTS

W. L. Haley
A. B. Carey
W. T. Manning

CORPORALS

F. H. Buck
H. V. Taylor
H. H. Ewing
D. A. Price
W. C. Wills
E. W. Martin

PRIVATES

G. C. Brower
H. W. Ewing
E. P. Catts
L. C. S. Dorsey
J. C. Hastings
J. M. Heinel
A. L. Lauritsen
J. L. Ritz
E. M. Marks
W. V. Marshall
R. L. Sumwalt
S. R. M. Thomson
D. C. D. Todd
T. M. Whiteman

COMPANIES

Captains

A	B	C
H. M. Grieves	H. V. Lindsay	W. I. Brockson

First Lieutenants

A. M. Jones	J. Weaver	G. F. Alderson

Second Lieutenants

L. G. Gibney	W. H. Alderson	W. L. Torbert
	P. D. Geoghegan	A. K. Mearns

First Sergeants

G. O. Smith	J. W. Ramsey	C. D. Pepper

Quartermaster Sergeants

W. C. Newton	R. Weimer	W. B. Seward

Sergeants

H. M. Foster	O. F. E. Gentieu	L. G. Mulholland
V. H. Handy	J. A. Crothers	G. P. Doherty
A. G. Heinel	H. Samonisky	J. H. Salevan

Corporals

T. R. Wilson	J. A. Hopkins	W. E. Diefenderfer
V. A. Hastings	L. B. Steele	M. J. Fidance
J. W. O'Daniel	J. H. Beauchamp	H. W. Horsey
R. H. Pepper	F. T. Campbell	C. K. McDowell
R. M. Appleby	Y. E. Rhodes	S. D. Loomis
E. G. Smyth	A. Ruth	J. H. Ellegood

Privates

J. E. Baylis
A. Berkman
H. A. Broadwater
G. B. Brown
H. L. Brown
E. W. Densmore
D. F. Dougherty
H. E. Elliott
G. L. Gooden
J. P. Gum
R. D. Herdman
J. L. Heyd
J. R. Hodgson
E. F. Hudson
J. H. Jones
J. W. Jones
H. L. Kister
J. H. Little
R. S. Lynam
R. B. McMullin
S. C. Marvel
J. A. Mather
W. T. Mitchell
J. H. Moore
J. A. O'Daniel
W. Price, Jr.
W. A. Rhodes
C. R. Smith
E. G. Smyth
L. Sparks, Jr.
O. Suddard
A. B. Thomas
W. deValinger
R. W. Wallace
A. S. Walton
E. S. Wilson
M. Wilson
L. R. Witsil

J. H. Alderson
J. W. Alexander
L. Blumberg
K. R. Bowen
H. W. Bramhall
W. D. Cannon
J. R. Carrow
T. S. Carswell
H. P. Cleaver
E. W. Clouser
D. L. Crockett
A. Cuningham, Jr.
E. W. Dawson
H. W. Downing
D. S. Folsom
F. A. Gilman
A. H. Graham
V. T. Gray
F. Groff
R. C. Hill, Jr.
W. B. Hoey
E. Hoffecker
H. S. Hoffecker
C. S. Holland
D. P. Horsey
E. Lacklen
P. D. Lovett
C. F. Meyers
B. F. Morrison, Jr.
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R. B. Pierson
F. I. Reynolds
A. Ruth
Y. E. Rhodes
W. H. Savin
L. L. Smart
R. H. Studley
H. M. Veasey
A. S. Wise

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H. B. Beacom
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J. E. Brayshaw
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G. M. Crawford
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J. F. Davis
J. H. Ellegood
J. Evans, Jr.
C. R. Fischer
R. P. Goldey
R. Hayward
G. A. Hudson
W. G. Hutton
E. E. Lloyd
S. D. Loomis
F. C. McCaghey
F. P. McCarthy
W. R. Miller
A. M. Montgomery
M. R. Mitchell
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R. L. Ritz
C. B. Sypherd
E. W. Seely
K. B. Schilling
D. T. Swing
P. G. Swayne
L. B. Stayton
C. Smith
N. Taylor
C. R. Tunnell
F. H. Tyson
R. B. Wheeler, 2d

DEGREES CONFERRED AT THE ANNUAL COMMENCEMENT

JUNE 17, 1914

Bachelor of Arts (Arts and Science Course)
Alfred Preston Scott

Bachelor of Science (Arts and Science Course)
Archie Homewood Dean
Norman Armstrong Groves
Henry Harrison Morgan, Jr
Tobias Rudulph
Joseph Edward Watts

Bachelor of Science in Agriculture
Paul Emerson

Bachelor of Science in Civil Engineering
Walter George Aurand
Alfred Chamberlain Connellee
Charles Edmund Grubb
Joseph Warren McCafferty
Norman Joseph McDaniel
John Harold Veale

Bachelor of Science in Mechanical Engineering
Clinton Harriott Brown
*Paul Raymond Dougherty
Carl Webster Hearne
Elmer Keller Hoch
Wallace Todd McCall
Daniel Raymond McNeal

Bachelor of Science in Electrical Engineering
Robert Walker Cranston
Arthur Cleveland Huston
Wilbur Earle Lind
Emery Wight Loomis
Samuel Miller Shallcross

**Degree conferred, November* 24, 1914

PRIZES AWARDED AT THE COMMENCEMENT OF 1914

The Bishop Coleman Memorial Prize: Charles Edmund Grubb.

The Lewis P. Bush Prizes: First prize, Joseph Edward Watts; second prize, Edward William Martin.

The William D. Clark Prize: Leo Blumberg.

The Trustee Prize: Washington Irving Brockson.

The W. C. T. U. Prizes: First prize, Washington Irving Brockson; second prize, Russell Paynter; third prize, George France Alderson.

Agricultural Prizes: First prize, William Buchanan Seward; second prize, Warren Childs Newton; third prize, William Elmer Diefenderfer.

The Lieutenant Clarke Churchman Memorial Prize, Emery Wight Loomis.

The Roberts' Medal for the Best Drilled Company: Company B, Charles Edmund Grubb.

The Francis A. Cooch Prize: James Henry Salevan.

The Philo Sherman Bennett Prize: Horace Leland Brown.

The Clifford Stelle, Jr., Prize: First prize, Fifteen Dollars, Edwin Gaylord Smyth; second prize, Ten Dollars, John Abel Hopkins.

The Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware for 1914-1915 was awarded to Robert Sumwalt, class of 1918.

STUDENTS IN ATTENDANCE DURING THE COLLEGIATE YEAR 1914-15

Abbreviations: A. & S., Arts and Science; A., Agriculture; C. E., Civil Engineering; M. E., Mechanical Engineering; E. E., Electrical Engineering; Ch. E., Chemical Engineering.

GRADUATE STUDENT

Emerson, Paul	A.	Kirkwood

SENIOR CLASS

Adams, Howard Horsey	E. E.	Laurel
Alderson, George France	C. E.	Wilmington
Alderson, William Hulburd	A. & S.	Wilmington
Beacom, Hamilton Bartlett	A. & S.	Wilmington
Bennett, Harry Thomas	A. & S.	Wilmington
Brockson, Washington Irving	A.	Middletown
Brown, Horace Leland	A. & S.	Lewes
Cann, William Ferris	A. & S.	Middletown
Carey, Alfred Bradley	A. & S.	Georgetown
Dorsey, Leighton Coleman Spence	A. & S.	Wilmington
Geoghegan, Presley Downs	A & S.	Delaware City
Gibney, Louis Garland	A.	Wilmington
Grieves, Harry Mahood	A.	Smyrna
Heyd, John Leslie	E. E.	Felton
Jones, Allan Marshall	E. E.	Milford
Lacklen, Edward	A. & S.	Wilmington
Lindsay, Herbert Vivian	E. E.	Wilmington
Little, Herman Joseph	A. & S.	Wilmington
McCarthy, Francis Patrick	C. E.	Wilmington
Manning, Eugene Reynolds	Ch. E.	Wilmington
Manning, William Thomas	M. E.	Lewes
Mearns, Andrew Kirkpatrick	A.	Wilmington
Montgomery, Harry Thomas	E. E.	Rising Sun, Md.
Moore, James Howard, Jr.	C. E.	Cherry Hill, Md.
Owens, Linden Gray	C. E.	Bridgeville
Paynter, Russell	A. & S.	Nassau
Rhodes, Yorke Edward	A. & S.	Edge Moor
Russell, Lynford Outten	A.	Lewes
Schaffle, Albert	A.	Philadelphia, Pa.
Souder, Earle Curriden	E. E.	Wilmington

Stiver, Ellwood Hamilton	A. & S.	Nazareth, Pa.
Suddard, Oliver	E. E.	Newark
Torbert, William Leonard, Jr.	A. & S.	Laurel
Weaver, Joseph	C. E.	Wilmington
Wingate, Thomas Vail	A. & S.	Edge Moor
Wise, Allen Sherwood	M. E.	Wilmington
Woodman, Eugene Ross	C. E.	Wilmington

JUNIOR CLASS

Blumberg, Leo	E. E.	Wilmington
Bounds, Harvey Chaplain	A. & S.	Dagsboro
Bramhall, Howard Wellington	A. & S.	Georgetown
Brayshaw, James Ellis	A. & S.	Delmar
Buck, Frank Haley	Ch. E.	Wilmington
Clouser, Edward Harvey	M. E.	Marshallton
Crothers, James Alexander	C. E.	North East, Md.
deValinger, Wesley	C. E.	Middletown
Doherty, Gerald Paul, Jr.	C. E.	Wilmington
Ewing, Homer Hazel	M. E.	Wilmington
Foster, Harold Morrison	C. E.	Wilmington
Gentieu, Oscar Franklin Edwin	C. E.	Wilmington
Graham, Augustus Howell	C. E.	Charlestown, Md.
Groff, Frazier	A.	Clayton
Haley, Walter Leslie	Ch. E.	Wilmington
Handy, Victor Hugo	C. E.	Milford
Hoch, Walter Keller	E. E.	Woodside
Jones, John Wesley	A. & S.	Woodside
Martin, Edward William	A. & S.	Wilmington
Mather, John Avery	M. E.	Oswego, Kansas
Morrison, Benjamin Frank, Jr.	C. E.	Wilmington
Mulholland, Lionel George	A.	Riverside, N. J.
Newton, Warren Childs	A.	Bridgeville
Pepper, Carlton David	A. & S.	Georgetown
Price, Donald Adams	M. E.	Wilmington
Price, John Michael	E. E.	Wilmington
Ramsay, John Wilbert	M. E.	Newark
Salevan, James Henry	A.	Milford
Samonisky, Harris	A. & S.	Delaware City
Seward, William Buchanan	A.	Middletown, N. Y.
Smith, George Oscar	A.	Narberth, Pa.
Taylor, Harry Vandom	M. E.	Dover
Wallace, Robert William	M. E.	Rockland
Walls, Carlton Beck	A. & S.	Smyrna
Weimer, Robert	A.	New York City
Wills, William Compton	C. E.	Wilmington

SOPHOMORE CLASS

Appleby, Richard Morrison	A.	New Castle
Beauchamp, John Hurst	C. E.	Wilmington
Brower, George Clarence	M. E.	Federalsburg, Md.
Cameron, Raymond Mearns	A. & S.	North East, Md.
Campbell, Franklin Tracy	A.	Washington, D. C.
Crawford, George Marter	A. & S.	Wilmington
Dawson, Edward Haigh	A.	Elkton, Md.
Edgar, John	A.	Wilmington
Ewing, Harvey Wilson	A.	Zion, Md.
Fidance, Michael Joseph	C. E.	Wilmington
Hastings, James Carlton	A. & S.	Laurel
Hastings, Vaughn Archelaus	A. & S.	Delmar
Heinel, Arthur Garrett	A. & S.	Newark
Heinel, James McConnell	A.	Newark
Hopkins, John Abel, Jr.	A.	Newark
Horsey, Harold Wolfe	A. & S.	Dover
Jones, Joseph Holton, Jr.	C. E.	Wilmington
Loomis, Stanley Drake	E. E.	Meshoppen, Pa.
McCaghey, Frederick Colin	A. & S.	Baltimore, Md.
Marshall, William Virden	A.	Lewes
O'Daniel, John Wilson	A.	Newark
Pepper, Robert Houston	A. & S.	Philadelphia, Pa.
Ruth, Albert	C. E.	Wilmington
Smith, Chester	M. E.	Henry Clay
Smyth, Edwin Gaylord	C. E.	Wilmington
Steele, Leroy Bayard	C. E.	Elsmere
Veasey, Harold Mercer	Ch. E.	Wilmington
Wilson, Thomas Rickards, Jr.	A. & S.	Ellendale

FRESHMAN CLASS

Alderson, John Hartzell	A. & S.	Marshallton
Alexander, Harry Bratton	Ch. E.	Clayton
Alexander, John William	E. E.	Wilmington
Baylis, John Egmont	A. & S.	Odessa
Berkman, Alec	E. E.	Bridgeville
Bowen, Knowles Ritchie	C. E.	Wilmington
Braderman, Manuel Wilbur	A.	Newark
Bratton, Howard, Jr.	A. & S.	Elkton, Md.
Brown, Gassaway Bond	A. & S.	Wilmington
Cannon, Samuel	A. & S.	Newark
Cannon, William Dail	E. E.	Middletown
Carrow, Joseph Raynor	A. & S.	Doylestown, Pa.
Carswell, Thomas Smyth	Ch. E.	Elkton, Md.
Catts, Elmer Paul	E. E.	Elkton, Md.
Cleaver, Henry Paul	C. E.	Wilmington

Cooper, Harold Ralston	A. & S.	Aikin, Md.
Creadick, William Reynolds	A. & S.	Elkton, Md.
Crockett, David Leonard	A.	New York, N. Y.
Davis, Jonathan Farr	A.	Meshoppen, Pa.
Densmore, Eugene Wesley	A.	Marblehead, Mass.
Dougherty, Daniel Francis	M. E.	Wilmington
Downing, Hugh Wagner	C. E.	Dover
Evans, John, Jr.	A.	Wilmington
Fischer, Carl Rudolph	A.	Philadelphia, Pa.
Gilman, Francis Albert	A.	Philadelphia, Pa.
Goldey, Robert Perkins	A.	Wilmington
Gooden, George Leslie	A. & S.	Woodside
Gray, Vaughn Townsend	A. & S.	Salisbury, Md.
Gum, John Poole	A. & S.	Selbyville
Herdman, Rowland Delaware	Ch. E.	Newark
Hill, Robert Clarke, Jr.	E. E.	Redden
Hodgson, Jonathan Reynolds	C. E.	Townsend
Hoey, William Bigelow	E. E.	Frederica
Hoffecker, Elwood	A.	Newark
Hoffecker, Harvey Simpson	A. & S.	Newark
Holland, Clyde Simpson	A.	Smyrna
Horsey, Donald Pancoast	A. & S.	Dover
Hudson, Earle Frank	E. E.	Georgetown
Hudson, George Allen	A. & S.	Lewes
Hutton, William Greenhalgh	C. E.	Wilmington
Kienle, Philip Joseph	Ch. E.	Wilmington
Lauritsen, Allen Louis	C. E.	Lewes
Little, James Herman	E. E.	Newark
Litz, Joseph Leslie	M. E.	Wilmington
Lovett, Paul DeWitt	A. & S.	Newark
Marks, Ernest Melson	Ch. E.	Wilmington
Meyers, Charles Fulmer	A. & S.	Middletown
Miller, William Rowland	E. E.	Marshallton
Mitchell, Morris Randolph	A. & S.	Newark
Mitchell, William Terry	M. E	Newark
Montgomery, Albert Norton, Jr.	E. E.	Laurel
Morris, Arthur Hudson	E. E.	Lewes
Nickerson, Earl Franklin	Ch. E. Spec.	Wilmington
O'Daniel, James Allison	A.	Newark
Price, William, Jr.	A.	Middletown
Reynolds, Irving	A. & S.	Akron, O.
Rhodes, William Albert	A.	Newark
Ritz, Robert Louis	A. & S.	Newark
Savin, William Homer	A.	Cheswold
Saylor, Frank	A. & S.	Wilmington
Schilling, Karl Browne	A. & S.	Wilmington
Seeley, Esek Walter	A.	Philadelphia, Pa.
Smart, Lawrence Landon	M. E.	Baltimore, Md.

Smith, Chester Richland	A.	Narberth, Pa.
Sparks, Lee, Jr.	A. & S.	Odessa
Stayton, Leon Busick	A. & S.	Wilmington
Studley, Reuben Henry	A.	Laurel
Sumwalt, Robert Llewellyn	C. E.	Lewes
Swayne, Paul Gilbert	A.	Wilmington
Swing, David Thompson	M. E.	Ridgely, Md.
Sypherd, Clarence Burton	A. & S.	Dover
Taylor, Nathaniel Watkins	A.	Dover
Todd, DeWitt Clinton Davis	C. E.	Wilmington
Tunnell, Charles Rodney	A. & S.	Georgetown
Tyson, Frank Howell	A.	Canton, O.
Walton, Albert Slack	E. E.	Newark
Wheeler, Robert Bayne, 2d	A. & S.	Wilmington
Whiteman, Thomas Moore	A.	Delaware City
Wier, Robert, Jr.	Ch. E.	Wilmington
Wilson, Ernest Staton	C. E.	Wilmington
Wilson, Marvel	A.	Ellendale
Witsil, Lawrence Raymond	E. E.	Wilmington

SPECIAL STUDENTS

Clothier, Robert Lee	Ch. E.	New Castle
Marshall, James Orton	A.	Lewes
Plumley, Raymond Walter	A. & S.	Newark

TWO YEARS' COURSE IN AGRICULTURE

SECOND YEAR

Cuningham, Alan, Jr.	Media, Pa.
Diefenderfer, William Elmer	Wyoming
Ellegood, Joshua Horsey	Delmar
McDowell, Charles Kendall	Middletown
Thomas, Alfred Bailey	Philadelphia, Pa.
Thomson, Stuart Robinson Moore	Narberth, Pa.

FIRST YEAR

Broadwater, Howard Allen	Glencoe, Pa.
Dickey, Richard Earle	Stanton
Elliott, Harry Edward	Delmar
Folsom, David Sweatt	Wilmington
Kister, Henry LeRoy	Philadelphia, Pa.
Lloyd, Earl Elesberry	Wilmington
Lynam, Rodney Sharpley	Wilmington
McMullen, Rowland Boulden	Glasgow
Marvel, Stanford Clark	Dover
Pierson, Ralph Boyd	Newark

SUMMARY

	ARTS AND SCIENCE	AGRICULTURE	ENGINEERING	TOTAL
Graduate	0	1	0	1
Seniors	15	6	16	37
Juniors	8	7	21	36
Sophomores	9	9	10	28
Freshmen	26	22	34	82
Special	1	1	1	3
	59	46	82	187
2 Yr. Agri. 2d Year		6		6
2 Yr. Agri. 1st Year		10		10
	59	62	82	203

SUMMER SCHOOL FOR TEACHERS SESSION OF 1914

FACULTY

SAMUEL CHILES MITCHELL, Ph. D.
PRESIDENT

GEO. A. HARTER, PH. D., DIRECTOR

CHARLES A. WAGNER, PH. D., State Commissioner of Education, Dean

W. OWEN SYPHERD, PH. D. - - - - - - - - - - - *English*
GEORGE E. DUTTON, M. A. - - - - - - - - - - - - *English*
CLARENCE A. SHORT, M. S. - - - - *Mathematics and Physics*
HOWARD K. PRESTON, C. E. - - - - - - - - - - *Mathematics*
FLORENCE CAMPBELL (West Chester Normal School) - - - - *Geography and Music*
J. LINWOOD EISENBERG, PH. D. (West Chester State Normal School) - - - - - - - - - - - - - *School Management*
HULDAH BRUST (Frederick High School) - *Elementary Methods*
RAYMOND C. REED, PH. D., D. V. M. - *Physiology and Hygiene*
EARNEST V. VAUGHN, PH. D. - - - - - - *History and Civics*
F. B. HILLS, M. S. - - - - - - - - - - - - - - *Agriculture*
RONALD F. DAVIS (Director of Art and Industrial Training, Wilmington) - - - - - - - - - - - - - - - *Drawing*
EDWARD LAURENCE SMITH, M. A. - - - - - - - - *French*
ELISHA CONOVER, M. A. - - - - - - - - - - - - - *Latin*
WILLIAM J. McAVOY, C. E. - - - - - - - *Physical Director*
C. BELLE MOORE (Houston Schools) - - - - - - - - - - - - *Conductor of School of Observation*

STUDENTS IN ATTENDANCE AT THE SUMMER SCHOOL SESSION OF 1914

Anderson, Matilda	Harrington
Anderson, Violet	Lincoln City
Angstadt, Annabel	Felton
Anthony, Garner	Philadelphia, Pa.
Arrants, Annie G.	North East, Md.
Baker, Effie	Willards, Md.
Baker, Mary Blanche	Stockley
Barkley, Helen S.	Elsmere
Bender, Nevin	Greenwood
Benson, Nettie E.	Laurel
Bethards, Harriet G.	Berlin, Md.
Betts, A. R.	Dagsboro
Bigger, Elizabeth	Wilmington
Blackstone, Maud E.	Millsboro
Bowen, Katharine G.	Newark
Bradley, Isadora A.	Porter
Brown, Helen L.	Elkton, Md.
Brown, Helen R.	Wilmington
Brown, Horace L.	Lewes
Bullen, Miriam	Christiana
Burt, Frances Hale	Milford
Cahall, Pearl	Harrington
Cameron, Raymond M.	North East, Md.
Cameron, Mary K.	Felton
Campbell, Emma M.	Marshallton
Campbell, Ethel D.	Newark
Campbell, Marion S.	Newark
Carlisle, Beatrice	Marydel, Md.
Carey, Burtie	Millsboro
Churchman, Rebecca P.	Newport
Cleaver, Blanche M.	Mt. Pleasant
Colbert, Florence E.	Newark
Cooch, F. Allyn, Jr.	Newark
Cooch, Richard	Newark
Cote, Alice E.	Cheswold
Coulter, Clara E. A.	Greenwood
Crothers, Ruth M.	Nottingham, Pa.
Curry, Mildred	Bridgeville
Davis, Elsie E.	Newark
Deakyne, Maude H.	Middletown
Derickson, Kathryn	Ocean View

Dickerson, Delema	Bridgeville
Dickerson, Leta S.	Newark
Donovan, Susie E.	Frederica
Downs, Sadie S.	Clayton
Ellingsworth, Burtie	Millsboro
Ellingsworth, Grace	Seaford
Elliott, Grace	Bridgeville
Ellison, Julia W.	Porters
Evans, Eleanor Stockton	Milford
Evans, Viola	Millville
Fader, Raymond	Newark
Ferguson, Esther P.	Newark
Ferguson, Mildred L.	Newark
Finn, Viola C.	Elkton, Md.
Gallaher, Anna E.	Newark
Garrett, Leah	Wilmington
Gatchell, Harriet G.	Wilmington
Gillespie, Minnie B.	Port Deposit, Md.
Gordy, Walter H.	Millsboro
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Hearne, Bessie	Frankford
Heim, Walter H. C.	Ellendale
Heinel, Arthur G.	Newark
Heinel, James	Newark
Heiser, Olive F.	Newark
Herdman, Rowland D.	Newark
Hinchman, Mary S.	Elkton, Md.
Hoffecker, Alice	Newark
Hoffecker, Mary S.	Newark
Holt, Margaret Anne	Elkton, Md.
Holton, Bertha	Frankford
Holton, Walter D.	Newark
Hopkins, Ethel	Elkton
Houseman, Katie	Greenwood
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Hurlock, Mary	Bridgeville
Jacobs, Mildred	Felton
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Jones, Mary	Frederica
Kenney, Mary	Laurel
King, Laura E.	Millsboro
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Lecates, Samuel S.	Laurel
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Lockwood, Marietta	Wyoming

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McMurray, Elizabeth	Seaford
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Messick, Edna	Georgetown
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Mitchell, Morris Randolph	Newark
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Moore, Mae	Ocean View
Morris, Bessie	Seaford
Morris, Bessie E.	Leipsic
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Owens, Pearl	Greenwood
Palmer, Maude Grace	Frederica
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Pearson, Edna	Wyoming
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Phillips, Mary	Rehoboth
Pierson, Elizabeth	Newark
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Ralph, Mabel E.	Laurel

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Rickards, Madge	Ocean View
Riley, Jennie	Wilmington
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Ritz, Walter R.	Newark
Robinson, Editn A.	Newark
Rogers, Bernice	Georgetown
Rowan, Frederick Johnson	Newark
Safranek, Sylvia L.	Fort duPont
Safranek, Mildred	Fort duPont
Scarborough, Iva C.	Georgetown
Scarborough, R. Dale	Georgetown
Scott, Emily Fulton	Newark
Scott, Emily Alexander	Elkton
Scott, Isabel Alden	Elkton
Shallcross, Edith	Middletown
Shockley, Naomi	Townsend
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Springer, Rebecca C.	Newport
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Steele, Laura P.	Marshallton
Stelle, Mary L.	Faulkland
Street, Naomi	Newark
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Stroud, R. Elisabeth	Christiana
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Swain, Ethel E.	Milford
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Timmons, Florence B.	Bear Station
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Warren, Lina J.	Ellendale
Warren, Raymond L.	Ellendale
Webb, Margaret	Ellendale
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West, Sallie E.	Georgetown
White, Norman M.	Millsboro
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Wilson, Florence W.	Wilmington
	North East, Md.

Wilson, Katharine	Newark
Wilson, George W.	Newark
Willis, Reba A.	Dover
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Wollaston, Helen	Newark
Wootten, Jennie	Millsboro
Wright, Clara M.	Laurel

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1915-1916

PUBLISHED QUARTERLY BY THE COLLEGE

NEWARK, DELAWARE

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DELAWARE COLLEGE BULLETIN

OLUME XI NEW SERIES NUMBER 1

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CATALOGUE

OF

DELAWARE COLLEGE

1915-1916

WITH

ANNOUNCEMENTS FOR 1916-1917

PUBLISHED BY THE COLLEGE

NEWARK, DELAWARE

1916

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CALENDAR

1916

January 31	Monday	Second term begins, 8.45 a. m.
March 7	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 20	Thursday	Easter recess begins, 4.45 p. m.
April 25	Tuesday	Easter recess ends, 8.45 a. m.
May 30	Monday	Memorial Day: a holiday
June 5-10		Final Examinations
June 11	Sunday	Address—Young Men's Christian Association, 11.00 a. m. Baccalaureate Sermon, 8.00 p. m.
June 12	Monday	Class Day
June 13	Tuesday	Meeting of the Trustees, 10.30 a. m. Alumni Day
June 14	Wednesday	Commencement Exercises, 10.30 a. m. Alumni Luncheon and meeting, 1.00 p. m.
June 16-17		Examinations for Admission

SUMMER VACATION

June 26	Monday	Summer School for Teachers opens.
August 4	Friday	Summer School for Teachers closes.
September 19-20		Examinations for Admission
September 21	Thursday	First term begins, 8.45 a. m.
November 28	Tuesday	Meeting of the Trustees, 10.30 a. m.

November 30	Thursday	Thanksgiving Day: a holiday
December 23	Saturday	Christmas recess begins, 12.45 p. m.
1917		
January 3	Wednesday	Christmas recess ends, 8.45 a. m.
January 18-27		Mid-Year Examinations
January 29	Monday	Second term begins, 8.45 a. m.
March 6	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 5	Thursday	Easter recess begins, 4.45 p. m.
April 10	Tuesday	Easter recess ends, 8.45 a. m.
May 30	Wednesday	Memorial Day: a holiday
June 4-9		Final Examinations
June 10	Sunday	Address—Young Men's Christian Association, 11.00 a. m. Baccalaureate Sermon, 8.00 p. m.
June 11	Monday	Class Day
June 12	Tuesday	Meeting of the Trustees, 10.30 a. m. Alumni Day
June 13	Wednesday	Commencement Day
June 15-16		Examinations for Admission

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JOSEPH H. HOSSINGER, Newark 1908
THOMAS DAVIS, ESQ., Wilmington 1908
PRESTON LEA, Wilmington 1909
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EDWARD D. HEARNE, ESQ., Georgetown 1910
HENRY RIDGELY, ESQ., Dover 1911
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EVERETT C. JOHNSON, Newark 1911
HENRY B. THOMPSON, Wilmington 1912
EBEN B. FRAZER, Newark 1913
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HAMILTON M. BARKSDALE, Wilmington 1915

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Professor of Ancient Languages and Literatures

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Dean of the College, and Professor of Modern Languages and Literatures

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Professor of Mechanical Engineering

CLINTON OSBORNE HOUGHTON, B. A.
Professor of Biology

WILBUR OWEN SYPHERD, PH. D.
Professor of English

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Dean of the Agricultural Department, and Professor of Animal Husbandry

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Professor of Mathematics and Engineering

CHARLES ANDREW MCCUE, B. S.
Professor of Horticulture

ARTHUR ELLIOTT GRANTHAM, B. A., B. S. A.
Professor of Agronomy

WILLIAM JAMES ROWAN, PH. D.[1]
Professor of Rhetoric and Oratory

---

1 Resigned, October, 1915.

CHARLES LYNDALL PENNY, M. A., SC. D.
Professor of Chemistry, Mineralogy, and Geology

EARNEST VANCOURT VAUGHN, M. A., PH. D.
Professor of History and Economics
[State of Delaware Chair of History]

RAYMOND CLINTON REED, PH. B., D. V. M.
Professor of Bacteriology and Hygiene

FIRMAN THOMPSON, B. S.
Professor of Agricultural Chemistry

THOMAS FRANKLIN MANNS, M. S., PH. D.
Professor of Plant Pathology and Soil Bacteriology

GEORGE ALBERT KOERBER, E. E.
Professor of Electrical Engineering

CHARLES CHRISTOPHER HERMAN
First Lieutenant, Infantry, U. S. A.
Professor of Military Science and Tactics, and Commandant of Cadets

GEORGE S. COUNTS, A. B.[1]
Professor of Psychology and Education

HAROLD EDWARD TIFFANY, M. S.
Assistant Professor of Chemistry

ZACHARYA HARRY SRAGER, B. S.
Assistant Professor of Mechanical and Electrical Engineering

GEORGE ELLIOTT DUTTON, M. A.
Assistant Professor of English

ARTHUR CRAIG WHITTIER, B. S.
Assistant Professor of Agricultural Chemistry

WILLIAM ALLEN LINTNER, B. S.
Assistant Professor of Agronomy

---

1 Appointed, November, 1915; to enter upon his duties, June, 1916.

HOWARD KENT PRESTON, C. E.
Assistant Professor of Mathematics and Engineering

FRANK BURROWS HILLS, M. S.
Assistant Professor of Animal Husbandry

WILLIAM JAMES MCAVOY, C. E.
Physical Director and Instructor in Mathematics

RAYMOND RANDALL PAILTHORP, B. S.
Instructor in Horticulture

HERBERT HANNIBAL HILLEGASS, B. S.
Instructor in Electrical Engineering

REEVES DYER STRING
Instructor in Shop Work

FREDERICK JULIUS POHL, M. A.
Instructor in English

KENT ROBERTS GREENFIELD, PH. D.
Instructor in History and Economics

EDWARD HENRY SEHRT, PH. D.
Instructor in Modern Languages

WILLIS SUMNER PUTNAM, PH. D.
Instructor in Chemistry and Physics

A. M. POLLARD
Extension Instructor in Poultry Husbandry

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Assistant Librarian, MAY GILLESPIE KERR
Supervising Architect, FRANK MILES DAY
Secretary to the President, MARGARET BOWEN
Registrar, ELEANOR EUGENIA TODD
Secretary to the Dean, CORNELIA GILLESPIE PILLING
Superintendent of Grounds and Buildings, DAVID LEE ROSE

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Admission: Professor Short, Chairman; Professor Hayward, Professor Sypherd.

Advanced Degrees: Arts and Science—Professor Vaughn, Chairman; Professor Sypherd, Professor Reed.

Advanced Standing: Arts and Science—Professor Sypherd, Chairman; Professor Conover, Professor Vaughn. Agriculture—Professor Hayward, Chairman; Professor Grantham, Professor McCue. Engineering—Professor Robinson, Chairman; Professor M. Van G. Smith, Professor Koerber.

Athletics: Faculty Representatives on the Athletic Council—Professor McCue, President; Professor Edw. Laurence Smith, Vice-President; Mr. McAvoy, Manager.

Board of Advisers: For the Senior Class, Professor Koerber; for the Junior Class, Professor E. L. Smith; for the Sophomore Class, Professor Short; for the Freshman Class, Professor Sypherd.

Extension: Professor Vaughn, Chairman; Professor Reed, Professor Short.

Lectures: Professor McCue, Chairman; Professor E. L. Smith, Professor Sypherd.

Prizes: Professor Sypherd, Chairman; Professor Conover, Professor Reed.

Publicity: Assistant Professor Dutton, Chairman; Assistant Professor Srager, Assistant Professor Hills, Assistant Professor Preston.

Schedule: Professor M. Van G. Smith, Chairman; Professor Conover, Professor E. L. Smith.

Scholarship: Professor Hayward, Chairman; Professor Vaughn, Professor Sypherd, Professor M. Van G. Smith, Professor E. L. Smith, Professor Short.

Student Entertainments: Assistant Professor Dutton, Chairman; Professor Sypherd, Assistant Professor Preston, Mr. McAvoy.

EXPERIMENT STATION STAFF

Harry Hayward, M. S., Director
Charles A. McCue, B. S., Horticulturist
Arthur E. Grantham, B. A., B. S. A., Agronomist
Firman Thompson, B. S., Chemist
Thomas F. Manns, Ph. D., Plant Pathologist
Jacob J. Taubenhaus, Ph. D., Associate Plant Pathologist[1]
A. C. Whittier, B. S., Associate Chemist
W. A. Lintner, B. S., Assistant Agronomist
F. B. Hills, M. S., Assistant in Animal Husbandry
Raymond R. Pailthorp, B. S., Assistant Horticulturist
Lester W. Tarr, B. S., Assistant Chemist

Marion C. Butterworth, A. B., Secretary
Mary Little, Stenographer
Cecilia A. O'Rourke, Stenographer

AGRICULTURAL EXTENSION

Harry Hayward, M. S., Director
Elizabeth Jefferson, B. S., Home Economics
Hugh Fergus, B. S., Dairy Husbandry

COUNTY AGENTS

Levi H. Cooch, New Castle
Melville O. Pence, B. S., Kent
Ward C. Pelton, B. S., Sussex

STATE BOARD OF HEALTH LABORATORY

Herbert J. Watson, P. D., Bacteriologist

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1 Resigned, February, 1916.

DELAWARE COLLEGE

LOCATION

DELAWARE COLLEGE is situated at Newark, a quiet, well-ordered, and hospitable village of two thousand inhabitants in the northwestern part of the State. Newark is connected with Philadelphia, Wilmington, Baltimore, and Washington by the Pennsylvania, and Baltimore and Ohio Railroads, and there are few points in Delaware or in the Peninsular counties of Maryland distant from the village more than a few hours by rail. The region about Newark is one of the most healthful and beautiful on the Atlantic slope. The site of the college, near the center of the town, is one of unusual charm. The village has a supply of excellent water and is lighted by electricity. The healthfulness and attractiveness of the town have been greatly enhanced by the recent completion of a fine sewerage system.

FOUNDATION

Delaware College was chartered in 1833 by Act of the Delaware Legislature, and the doors of the college were first opened to students in May of the following year. The college had been doing for a quarter of a century an important work not only for Delaware, but as well for neighboring parts of Pennsylvania and Maryland, when, by a succession of misfortunes, she was forced in the spring of 1859 to close her doors.

Eleven years later, in the spring of 1870, the college was resuscitated, having meanwhile been designated by Act of the Delaware Legislature, as beneficiary under the Act of Congress apportioning to each of the several States large areas of public lands to form the basis of endowments for Colleges especially devoted to the teaching of Agriculture and the Mechanic Arts, and Military Tactics. This Act of Congress, commonly known as the "Morrill

Bill," from its originator, Senator Morrill of Vermont, declares that the colleges made beneficiary under its provisions shall have as their leading object, "without excluding other scientific and classical studies and including Military Tactics, to teach such branches of learning as are related to Agriculture and the Mechanic Arts * * * in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." In consideration of the designation and establishment of Delaware College as the institution to be provided by the State of Delaware in accordance with the provisions of the Act of Congress in question, "a joint and equal interest in the grounds, buildings, libraries, and vested funds of the College proper," was conveyed to the State of Delaware, and equal representation upon the Board of Trustees was given to the State.

The college was thus under combined private and State ownership until the legislative session of 1913, when, according to the terms of the Act to reincorporate Delaware College, approved March 19, 1913, it came into the sole possession of the State of Delaware. It is now in the full sense of the word a State College. The Board of Trustees "shall consist of twenty-eight members, together with the Governor of the State, the President of the College, the Master of the State Grange, and the President of the State Board of Education, all of whom shall be members of the Board, ex officio. "

BUILDINGS AND GROUNDS

Extensive additions are now being made to the grounds and buildings of the college. In May, 1915, a large tract of land lying between Delaware College and the Women's College of Delaware was given to the college by an unnamed donor. On this land buildings will be erected as needed. The plans which have already been made include a Science Hall, a Students' Club House, a Library, a Dormitory, an Engineering Hall, and an Audi-

torium. The Science Hall and the Students' Club House will be erected in 1916.

Frazer field, the gift of several members of the Frazer family of Newark, affords excellent facilities for outdoor sports and games.

Connected with the college, and used for purposes of instruction and experimentation, is the State Farm, a farm of 217 acres.

The buildings of The Women's College of Delaware, affiliated with Delaware College, are located on a plot of nineteen acres, half a mile from the college.

FINANCIAL SUPPORT

From 1870 to 1913 the college was supported entirely by Federal and State appropriations. As the result of the passage of the "Morrill Bill" of 1862, the college receives the income from the sale of public lands apportioned to the State of Delaware, the amount being $4980. Under the provisions of the "Hatch Bill," 1887, the Delaware College Agricultural Experiment Station was established The station receives $15,000 annually from this bill, and $15,000 addition annually from the "Adams Bill," 1906. From the "New Morrill Bill," 1890, the college receives now $20,000 annually, the expenditure of this sum being subject to the provisions of the "Morrill Bill" of 1862. This Act was supplemented by the passage of the "Nelson Bill," 1907, from which the college receives $20,000 annually. The appropriations provided for in this Act are to be applied "to instruction in Agriculture, the Mechanic Arts, the English Language, and the various branches of mathematical, physical, natural, and economic sciences with special reference to their application in the industries of life, and to facilities for such instruction." In 1914 the Alumni Association established the Alumni Endowment Fund, the income to be used to pay the President's salary. This fund has already reached the sum of $67,000. In 1915 an unknown donor gave to the college

$218,000 for the purchase of land, and $500,000 for the erection of buildings and for their maintenance.

The Smith-Lever Extension Bill, passed in 1914, appropriates $10,000 annually to each State and a proportionate share in an increasing appropriation beginning at $600,000 and reaching $3,000,000 in five years, depending upon the population of the State. In order to participate in the latter appropriation the State must appropriate an amount equal to that which is its share from the federal government beyond the fixed appropriation.

Apart from the National appropriations, the State has dealt liberally with the college in the past, having appropriated funds from time to time as they were needed for new buildings and the growing wants of the Institution.

SCOPE OF THE WORK

Courses of Instruction

The following Courses of Instruction are offered by Delaware College:

I **Arts and Science,** a four years' course, leading to the degree of Bachelor of Arts or Bachelor of Science. See pages 36 to 38.

II **Agriculture,** a four years' course, leading to the degree of Bachelor of Science. See pages 39 to 41.

III **Engineering**—Civil, Mechanical, Electrical, and Chemical, four years' courses, leading to the degree of Bachelor of Science. See pages 42 to 51.

Special courses in Agriculture not leading to a degree are offered to students of sufficient maturity who for good reasons are unable to meet the usual requirements for admission to the college, or are unable to spend four years in college.

Tuition is free to all students from the State of Delaware. The college constitutes a part of our system of free public instruction. In its scheme of education, the culture

of liberal learning and the practical usefulness of the applied sciences are equally emphasized.

Extension Work

Agriculture. The Agricultural Extension work of Delaware College is supported by a Federal appropriation known as the Smith-Lever fund, supplemented by State appropriations. The work is carried on largely by County Agents, one of whom is located in each county, and by a woman trained in home administration, who spends practically the whole of her time in the field.

The function of the field agent is to supply the people with the most helpful information, and render any service possible in the development of the agricultural resources.

The college co-operates with the field workers by supplying material and furnishing lectures, as well as by planning and assisting in inaugurating new projects.

General Lectures. The members of the Faculty of Delaware College and of the Women's College of Delaware will, as far as their time permits, deliver lectures before the schools, women's clubs, and other organizations throughout the State. The list of lecturers and lectures is given on pages 111 to 115.

Summer School

For the benefit of teachers and others who are qualified to do the work, a Summer School is held for six weeks each summer at Delaware College. The President of the College directs the work of the school. Elementary instruction in fundamental school subjects, including methods of teaching, is offered to teachers in the primary grades. Advanced instruction is offered to teachers in the higher grades. Each course is in charge of a specialist who is also a skilled instructor. The faculty is composed largely of members of the faculty of Delaware College. The session of 1916 will open on June 26 and close on August 4. Information will be furnished by the Director of the Summer School.

The following courses were given at the 1915 session: Elementary Agriculture; Art and Industrial Work, elementary and advanced courses; Elementary Latin; Primary Methods, School Management; Elementary English Grammar, Elementary Composition, Advanced Composition, American Literature; Political Geography; United States History, Civics; International Relations; Elementary Arithmetic, Advanced Arithmetic, Algebra, Plane Geometry; Physics; Physical Training; Physiology and Hygiene; Vocal Music.

The Experiment Station

The Delaware College Experiment Station, a research department of the college, was made possible by an Act of Congress passed in 1887, known as the Hatch Act. Under the Provisions of this Act each state received an annual appropriation of $15,000 for the establishment of an Agricultural Experiment Station. This was supplemented in 1906 by a similar act known as the Adams Act, which carried an annual appropriation of $15,000 for the use of the Agricultural Experiment Stations that had been established under the law of 1887.

The Experiment Station has a library, research laboratories, and a separate organized staff. It is investigating problems in the fields of Agronomy, Horticulture, Chemistry, Plant Pathology, Soil Bacteriology, and Animal Husbandry. The results of its investigations are published in the form of bulletins, which are distributed free of charge to those interested.

The Women's College of Delaware

Affiliated with Delaware College is the Women's College of Delaware, established by the State in September, 1914. The college offers three courses of instruction leading to degrees:

I **Arts and Science**, a four years' course leading to the degree of B. A. or B. S.

II **Education**, a four years' course leading to the degree of B. S.

III **Home Economics**, a four years' course leading to the degree of B. S.

IV **Agriculture**, a four years' course leading to the degree of B. S.

In addition to these regular courses, two years' courses in Education and in Home Economics are offered to students who are qualified to do the work. Tuition is free to students from the State of Delaware. Information in regard to the college may be obtained from the Dean of the Women's College.

REQUIREMENTS FOR ADMISSION

Students are admitted either upon examination at the college or upon certificates from accredited schools or from other colleges or universities. Examinations are held in June and September according to the schedule on page 34. Certificates from schools should be presented to the Chairman of the Committee on Admission as early as possible during the summer preceding the session of the college which students wish to attend. Blank certificates may be had upon application.

GENERAL REGULATIONS

Candidates for admission to the Freshman class must be at least 16 years of age and of good moral character.

It is desired that every candidate for admission shall have completed a four-year high school course.

Candidates wishing to receive entrance credits on subjects not offered in the schools from which they present certificates are required to take examinations in such subjects on days prescribed in the Calendar of the college.

Students should enter at the **beginning of the first term,** because the subjects which are begun at that time are not repeated in the second term.

Students will not be permitted to enter the college in the first term after October 15, unless they have completed an amount of work equivalent to the work already done by the classes which they wish to enter.

SPECIFIC REQUIREMENTS

Fourteen units are required for admission to all courses leading to degrees. No student will be admitted with more than two conditions.

The term **unit** means the equivalent of five recitations a week for one year in one subject.

The following units are required of all:

English	3 units
Mathematics (Plane Geometry and Algebra)	2½ "
History	1 "
Science	1 "
Modern Language	2 units
Total	9½ "

Additional units to the number of 4½ must be offered from the following list according to the specific regulations of the various courses of study.

Mathematics	
Solid Geometry	1 unit
Plane Trigonometry	½ unit
Foreign Languages	
Greek	1, 2, 3, or 4 units
Latin	1, 2, 3, or 4 units
German	1, 2, 3, or 4 units
French	1, 2, 3, or 4 units
History	
Ancient History	1 unit
Mediaeval and Modern	1 unit
English History	1 unit
United States	1 unit
Civics	½ unit
Science	
Botany	1 unit
Chemistry	1 unit
Physics	1 unit
Physical Geography	½ or 1 unit
Physiology	½ unit
Zoology	1 unit
Vocational Subjects	Units to be determined

Arts and Science

In addition to the 9½ units required of all, candidates may offer any of the subjects in the foregoing list

in order to make fourteen units. Candidates for the degree of A. B. must offer four units of Latin or Greek, or take a condition in this subject not exceeding 2 units.

Agriculture

In addition to the 9½ units required of all, candidates must select 4½ units from the foregoing list of elective subjects.

Engineering

In addition to the 9½ units required of all, candidates must offer 4½ additional units, including Solid Geometry (½ unit). A condition in this subject may be removed only by means of an extra course in college not counting for a degree. The required science for candidates for admission to courses in Engineering is Physics. Students who have to take in college the additional course in Solid Geometry or an extra year in Modern Languages will find it difficult to finish the course in Engineering in four years. Beginning with the academic year 1917-1918, no student will be admitted to a course in Engineering who has not satisfied completely the entrance requirements in Mathematics.

NOTE

All candidates for admission are examined in English Composition in order to test their ability to do the required English of the Freshman year. Students who fail in this examination must take an additional course in Elementary English not counting toward a degree. Examinations are held in June and September. Candidates are advised to take the examination in June. Those who fail will have the opportunity of working privately on this subject during the summer or of taking a course in English in the six-weeks' Summer Session.

Detailed Explanation of the Requirements for Admission

English

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

English Grammar and Composition

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description, and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted efforts of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

Literature

The second object is sought by means of two lists of books, headed respectively **Reading** and **Study**, from which may be framed a progressive course in literature covering four years. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable

passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

a **Reading.** The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units* are to be selected, two from each group:

Group I The Old Testament, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the Odyssey, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the Iliad, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Vergil's Aeneid. The Odyssey, Iliad, and Aeneid should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II Shakspere: Merchant of Venice; The Tempest; As You Like It; Twelfth Night; Midsummer Night's Dream; Romeo and Juliet; King John; Richard II; Richard III; Henry V; Coriolanus; Julius Caesar; Macbeth; Hamlet.

Group III Prose Fiction. Malory's Morte d'Arthur (about 100 pages); Bunyan's Pilgrim's Progress, Part I;

* Each unit is set off by semicolons.

Swift's Gulliver's Travels (voyages to Lilliput and Brobdingnag); DeFoe's Robinson Crusoe, Part I; Goldsmith's Vicar of Wakefield; Frances Burney's Evelina; Scott's Novels (any one); Jane Austen's Novels (any one); Maria Edgeworth's Castle Rackrent, or The Absentee; Dickens's Novels (any one); Thackeray's Novels (any one); George Eliot's Novels (any one); Mrs. Gaskell's Cranford; Kingsley's Westward Ho! or Hereward, the Wake; Reade's The Cloister and the Hearth; Blackmore's Lorna Doone; Hughes' Tom Brown's Schooldays; Stevenson's Treasure Island, or Kidnapped, or Master of Ballantrae; Cooper's Novels (any one); Poe's Selected Tales; Hawthorne's The House of the Seven Gables, or Twice Told Tales, or Mosses from an Old Manse; a collection of Short Stories by various standard writers.

Group IV Essays, Biography, etc. Addison and Steele's The Sir Roger de Coverley Papers, or Selections from the Tatler and Spectator (about 200 pages); Boswell's Selections from the Life of Johnson (about 200 pages); Franklin's Autobiography; Irving's Sketch Book (about 200 pages), or Life of Goldsmith; Southey's Life of Nelson; Lamb's Essays of Elia (about 100 pages); Lockhart's Life of Scott (about 200 pages); Thackeray's Lectures on Swift, Addison, and Steele in the English Humourists; Macaulay's Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederic the Great, Madame d'Arblay (any one); Trevelyan's Life of Macaulay (about 200 pages); Ruskin's Sesame and Lilies, or Selections (about 150 pages); Dana's Two Years before the Mast; Selections from Lincoln, including at least the two inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and the Letter to Horace Greeley, together with a brief memoir or estimate; Parkman's The Oregon Trail; Thoreau's Walden; Lowell's Selected Essays (about 150 pages); Holmes' The Autocrat of the Breakfast Table; Stevenson's An Inland Voyage, and Travels with a Donkey; Huxley's Autobiography, and

selections from Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; a collection of Essays by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of Letters by various standard writers.

Group V Poetry. Palgrave's Golden Treasury (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's Golden Treasury (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under **b**); Goldsmith's The Traveller, and The Deserted Village; Pope's The Rape of the Lock; A collection of English and Scottish ballads, as, for example, some Robin Hood ballads, The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens, and a selection from later ballads; Coleridge's The Ancient Mariner, Christabel, and Kubla Khan; Byron's Childe Harold, Canto III or IV, and The Prisoner of Chillon; Scott's The Lady of the Lake, or Marmion; Macaulay's The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry; Tennyson's The Princess, or Gareth and Lynette, Lancelot and Elaine, and Passing of Arthur; Browning's Cavalier Tunes, The Lost Leader, How They Brought the Good News From Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus—, Instans Tyrannus; Arnold's Sohrab and Rustum, and The Forsaken Merman; Selections from American poetry, with special attention to Poe, Lowell, Longfellow, and Whittier.

b Study This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are

arranged in four groups, from each of which one selection is to be made.

Group I Drama. Shakspere's Julius Caesar, Macbeth, Hamlet.

Group II Poetry. Milton's L'Allegro, Il Penseroso, and either Comus or Lycidas; Tennyson's The Coming of Arthur, The Holy Grail, and The Passing of Arthur; the selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's Golden Treasury (First Series).

Group III Oratory. Burke's Speech on Conciliation with America; Macaulay's Two Speeches on Copyright, and Lincoln's Speech at Cooper Union; Washington's Farewell Address, and Webster's First Bunker Hill Oration.

Group IV Essays. Carlyle's Essay on Burns, with a selection from Burns's Poems; Macaulay's Life of Johnson; Emerson's Essay on Manners.

Examination

However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling, or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies, and from his personal knowledge and experience quite apart from reading. For this purpose the examiner

will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include:

A General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under **(a) Reading**, above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

B A test on the books prescribed for **(b) Study**, which will consist of questions upon their content, form, and structure, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of the works, and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their other works, and the periods of literary history to which they belong.

History and Civics

(a) History. Ancient, Mediaeval and Modern, English, United States. The requirement is a regular year's work in one of these subjects.

(b) Civics. Whether given separately or in connection with United States History, this work must be the equivalent of a regular course pursued for a half year. Considerable attention should be given to the actual workings of government.

Mathematics

(a) Algebra. The four fundamental operations, with emphasis placed upon type form in multiplication and division, factoring, highest common factor, least common multiple, fractions, fractional equations, simultaneous

equations of first degree, evolution, theory of exponents, radicals, quadratic equations of one unknown quantity and solution of problems. Emphasis should be placed on factoring and solution of literal equations.
structions of good elementary text books. An important part of the work should be solution of original exercises, including loci and numerical problems. Accuracy and acuteness in thinking are desired more than mere geometrical knowledge.

(c) Solid Geometry. The usual theorems and constructions of good text books; relations of lines and planes; properties of prisms, pyramids, cylinders, cones; the sphere and spherical triangle. Emphasis should be placed on problems of mensuration, loci, and the relation

(b) Plane Geometry. The usual theorems and con-
of parts in spherical triangles and polygons.

(d) Advanced Algebra. Convergency and Summation of Series, Binomial Theorem, Permutations and Combinations, Undetermined Coefficients, Logarithms, Theory of Equations, and Determinants.

(e) Plane Trigonometry. Trigonometric ratios and their relations; derivation of general ratios; proofs of general formulas, especially trigonometric functions of sum of two angles, difference of two angles, and multiple angles; proving of identities; use of logarithms and solution of right and oblique triangles.

Physics

The completion of an ordinary text-book together with a sufficient number of laboratory exercises to illustrate the work is required of candidates. This work may be accomplished in one year by taking daily recitations and exercises.

Latin

1 The Latin reading required of candidates for admission to college, without regard to the prescription of

particular authors and works, shall be not less in amount than Caesar, Gallic War, I-IV; Cicero, the orations against Catiline, for Manilian Law, and for Archias; Vergil, Aeneid, I-VI.

2 The amount of reading specified above shall be selected by the schools from the following authors and works; Caesar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters and De Senectute) and Sallust (Catiline and Jugurthine War); Vergil (Bucolics, Georgics, and Aeneid) and Ovid (Metamorphoses, Fasti, and Tristia).

3 Grammar and Composition. The examination in grammar and composition will demand a thorough knowledge of all irregular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The Roman method of pronunciation is used.

Greek

Xenophon, Anabasis, Books I-IV. Homer, Iliad, Books I-III. A thorough knowledge of Greek Grammar.

Modern Languages

(a) German, Elementary. 1, careful drill in pronunciation; 2, the memorizing and frequent repetition of easy colloquial sentences; 3, drill upon the rudiments of grammar, that is, upon the inflection of the articles, of such nouns as belong to the language of every-day life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word order; 4, abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; 5, the reading of from 100 to 125 pages of graduated texts.

(b) German, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in German (b) will not be given credit for it unless they have passed also the examination in German (a).

Applications should be accompanied by a statement stating the text books used and the number of pages translated.

(a) French, Elementary. 1, careful drill in pronunciation; 2, the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural nouns, the inflection of adjectives, participles, and pronouns; the use of the personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; 3, abundant easy exercises, designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in reproduction of natural forms of expression; 4, the reading of from 100 to 125 pages of graduated texts.

(b) French, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in French (b) will not be given credit for it unless they have passed also the examination in French (a).

Applications should be accompanied by a statement stating the text books used and the number of pages translated.

Natural Science

One year's work of 38 weeks, five recitations weekly, of high school grade, covering the elementary principles of any one of the several sciences, will be accepted as an

entrance requirement. The student in addition to the examination must submit his notes on laboratory or field work of the year.

ADMISSION TO ADVANCED STANDING

Candidates for entrance to an advanced class in any of the courses are required either to sustain examinations in all studies of the courses up to the point at which they seek admission, or to present from other colleges certificates covering such studies.

ENTRANCE EXAMINATIONS

Entrance examinations will be held at the college in Newark, on Friday and Saturday, June 16 and 17, 1916, beginning at 9 a. m., also on Tuesday and Wednesday, September 19 and 20, 1916, at the same hours.

Ancient History or English History—9.00-10.30, Friday, June 16, and Tuesday, September 19.

Algebra—10.30-12.30, Friday, June 16, and Tuesday, September 19.

Geometry—1.30-3.00, Friday, June 16, and Tuesday, September 19.

Latin—3.15-4.30, Friday, June 16, and Tuesday, September 19.

Greek and Physics—9.00-10.30, Saturday, June 17, and Wednesday, September 20.

English—10.30-12.30, Saturday, June 17, and Wednesday, September 20.

History of the United States and Civil Government—1.15-2.45, Saturday, June 17, and Wednesday, September 20.

Solid Geometry—2.45-4.30, Saturday, June 17, and Wednesday, September 20.

Hours for examinations in other subjects will be arranged for with the candidates who offer such subjects.

COURSES OF STUDY

Delaware College offers the following courses of study:

I **Arts and Science**—A four years' course leading to the degree of B. A. or B. S.

II **Agriculture**—A four years' course leading to the degree of B. S. in Agriculture.
—Special courses in Agriculture not leading to a degree.

III **Engineering**—Civil, Mechanical, Electrical, Chemical—A four years' course leading to the degree of B. S. in the special field of study.

CHOICE OF STUDY

Students may, with the approval of their parents or guardians, enter any one of the departments; or they may select such studies as they are prepared to pursue, when circumstances make it advisable not to enter a regular course. Except in the case of mature students who may desire to do special work in any department, it is strongly urged that all students for admission prepare themselves for undertaking the work of a regular course. Opportunity is offered students of sufficient maturity and preparation, who do not wish to take any of the regular courses, to pursue special studies determined by some definite end in view.

Each special student is required to have at least fifteen recitations, or their equivalent, weekly, unless especially excused for cause.

Changes from one course to another may be made only at the opening of a term, with the approval of the Faculty and the consent of the parent or guardian.

COURSE IN ARTS AND SCIENCE

This course is designed to meet the requirements of a liberal education and to lay the foundation for professional and business careers. In accordance with this general aim considerable freedom in the choice of studies is allowed, particularly in the last two years of the course. The studies of the Freshman year are virtually prescribed.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 128 credit term-hours of work in addition to Military Science and Physical Training. During the Senior year, every candidate for graduation must submit a satisfactory thesis to the head of the Department in which he has taken his major.

Graduates from the course in Arts and Science who have offered for admission four years of Latin or Greek, or who have completed in college an equivalent amount of work will receive the degree of Bachelor of Arts; all other graduates will receive the degree of Bachelor of Science.

Prescribed Studies

	Term Hours	Credits
English	16	16
Mathematics	8	8
Modern Language	12	12
Science (Chemistry, 6; Zoology, Botany, or Physics, 6)	12	12
History and Economics	12	12
	—	—
	60	60
Military Drill	24	12
Physical Training	4	2

FRESHMAN YEAR

First Term	H.*	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Mathematics, 1, 2	4	4	Mathematics, 3, 4.....	4	4
Language—Latin, French, or German..	3	3	Language—Latin, French, or German..	3	3
History, 1	3	3	History, 1.....	3	3
Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6	Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6
Military Science, 1 ...	3	1.5	Military Science, 1....	3	1.5
Physical Training, 1..	1	0.5	Physical Training, 1..	1	0.5

*The capital letters H. and C. refer to Actual Hours and Credit Hours respectively.

SOPHOMORE, JUNIOR, AND SENIOR YEARS

At the beginning of the Sophomore year, every candidate for the degree of Bachelor of Arts or Bachelor of Science shall select from the following groups a major study, in which he shall complete thereafter 18 hours of work. In addition, he must take from the group from which he selects his major at least one additional course after the Freshman year.

During these three years students must take in addition to the required work in Military Science and Physical Training all prescribed subjects not completed in the Freshman year and Elective courses sufficient to make a total of thirty credit term-hours each year.

Group A	**Group B**
Greek	Biology
Latin	Chemistry
French	Mathematics and Physics
German	
English	
History and Economics	

Elective Courses

	First Term	*Second Term*
Ancient Languages, 1	3	3
Ancient Languages, 2	3	3
Ancient Languages, 3	3	3
Ancient Languages, 5	3	3
Ancient Languages, 6	3	3
Ancient Languages, 7	3	3
Ancient Languages, 10	3	3
Bacteriology, 1	3	3
Bacteriology, 2	1	1
Bacteriology, 5	3-5	3-5
Biology, 1	3	3
Biology, 2, 3	2	2
Biology, 4	3	3
Biology, 5	2	2
Chemistry, 2	3	3
Chemistry, 3	1.5	–
Chemistry, 4	–	1.5
Chemistry, 6	1.5	–
Chemistry, 7	3	3
Chemistry, 8	2	--
Chemistry, 9	1	–
Chemistry, 10	6	6
Chemistry, 11	1.0	–
Chemistry, 12	–	2
Chemistry, 13	1	–
Chemistry, 14	–	1
English, 4	3	3
English, 6	2	2
English, 8	2	2
English, 11	3	3
English, 12	–	2
English, 13	2	2
English, 14	1	1
History, 4	3	3
History, 5	3	–
History, 6	–	3
History, 7	3	–
History, 8	–	3
History, 9	3	–
History, 10	–	3
History, 12	3	3
History, 13	2 or 3	2 or 3
History, 14	1 or 2	1 or 2
Horticulture, 14	3	–
Mathematics, 6	4	–
Mathematics, 7	–	4
Mathematics, 8	3	3
Mathematics, 9	2	2
Mathematics, 12	2	–
Mathematics, 13	–	2
Mathematics, 14	2	–
Mathematics, 15	–	2
Mineralogy, 1	3	–
Mineralogy, 2	–	3
Modern Languages, 1	3	3
Modern Languages, 2	3	3
Modern Languages, 4	3	3
Modern Languages, 5	3	3
Modern Languages, 6	3	3
Modern Languages, 7	3	3
Modern Languages, 9	3	3
Modern Languages, 10	3	3
Modern Languages, 11	3	3
Modern Languages, 12	3	3
Physics, 1	3	3
Physics, 2, 3	1	1
Physics, 4	3	3
Psychology, 1	3	--
Psychology, 2	–	3
Psychology, 3	3	–
Psychology, 4	–	3

COURSES IN AGRICULTURE

FOUR YEARS' COURSE

The course in Agriculture leading to a degree combines a technical course with as much cultural training as possible. It includes a foundation in the fundamental sciences upon which is built a vocational superstructure.

The work is planned for the preparation of men who desire to become teachers of agriculture, farm managers, investigators, or specialists in some one of the various phases of Agriculture. To aid those who are undecided as to which lines they are best adapted, presentation subjects of the various courses are offered early in the course. The opportunity to specialize in any of the major branches is reserved until the Junior and Senior years.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 136 credit term hours of work in addition to military science and physical training.

Although considerable amount of practice work is given throughout the course, both in the laboratories and upon the farm, prospective students are urged to spend a year upon a well managed farm before entering college, to the end that they may more fully appreciate the course of study.

If it is impracticable to get this experience before entering college, students will be required to spend at least two summers, or their equivalent, before the Senior year in practice work upon a farm. All candidates for a degree must pass an examination in farm practice before October 15th of the Senior year.

Candidates for a degree in Agriculture must choose, before the beginning of the Junior year, either Agronomy, Animal Husbandry, or Horticulture, for a major course. A minimum of 18 hours from the courses offered by the Department which is chosen as a major must be elected. A minimum of four hours must be elected from courses

offered by each of the two departments not chosen for major work. Candidates for degrees must announce the subjects of their theses not later than January of the Junior year.

A student in Agriculture at his discretion may take during his course fifteen hours of elective subjects offered in departments other than Agriculture, provided that such elections do not interfere with required or back work. The remainder of the electives must be taken from Agricultural subjects, herein described.

A student will not be allowed to take more than 20 credit hours in any semester without first obtaining permission from the Dean of Agriculture.

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Mathematics, 1, 2	4	4	Modern Language, 1 or 10	3	3
Modern Language, 1 or 10	3	3	Biology, 4	5	3
History, 2	1	1	Chemistry, 1	3	3
Biology, 4	5	3	Agriculture, 1	3	2
Chemistry, 1	3	3	Elective (Minimum)		2
Agriculture, 1	3	2	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Chemistry, 2, 3	6	4.5	Chemistry, 2, 4	6	4.5
Physics, 1, 2	5	4	Physics, 1, 2	5	4
Elective (Minimum)		5	Elective (Minimum)		5
Military Science, 2	3	1.5	Military Science, 2	3	1.5
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Biology, 1	5	3	Biology, 1	5	3
Bacteriology, 1	5	3	Bacteriology, 1	5	3
Chemistry, 5	3	3	Chemistry, 5	3	3
Elective (Minimum)		7	Elective (Minimum)		7
Military Science, 3	3	1.5	Military Science, 3	3	1.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
History, 9	3	3	History, 8	3	3
Horticulture, 14	3	3	Agronomy, 7	5	3
Elective (Minimum)		10	Thesis		3
Military Science, 4	3	1.5	Elective (Minimum)		7
			Military Science, 4	3	1.5

Special Courses in Agriculture

Opportunities for Special Courses in Agriculture are provided for those who, for various reasons, are unable to pursue a four years' course, leading to a degree.

In order to become a special student, one must have had one year of recent experience on a farm, present ten of the units required for entrance, and be at least nineteen years of age. An applicant must satisfy the faculty of his ability to do the work assigned and give assurance of a sincere desire to avail himself of the opportunities offered by this department of the college.

Special students do not follow a prescribed program or course of study but are at liberty to elect such studies as they are prepared to take. The schedule of studies of special students must be filed with and approved by the Dean of Agriculture.

Special students are required to take all examinations and maintain a satisfactory standard of scholarship in order to hold their place in college.

COURSES IN ENGINEERING

CIVIL ENGINEERING

The objects of the course of instruction in Civil Engineering are, first, to fit those pursuing it previously to professional life to be, at graduation, immediately useful as assistants to practicing engineers and capable of rising rapidly to positions of responsibility; second, to meet the needs of those who, having been engaged, without a course of technical instruction, in professional work, desire to equip themselves for more successful competition with those who have had such instruction. As the objects can be most satisfactorily accomplished by such instruction as will impart accurate knowledge of natural laws and of the properties of materials and such training as will develop power to apply that knowledge intelligently, the technical studies are preceded by liberal and thorough instruction in language and in the mathematical and physical sciences.

The outline of the course of study in Civil Engineering on pages 44, 45 shows the subjects pursued, the number of hours per week, and the credit hours assigned to exercises in each. Full information regarding the subejcts is given on pages 66 to 70. Mature students of sufficient preparation may arrange for such modifications of the required work of the Senior year as will enable them to devote more time to a special subject or to pursue advanced work.

Instruction is by recitations, lectures, laboratory, drafting-room, field, and work-shop; by the use of current technical journals; and by visits, followed by reports, to structures in process of erection, good types of finished structures, and industrial establishments.

The main objects in laboratory, field, and shop-work are to secure mental discipline; and, by illustrating principles and impressing facts, to supplement the work of the lecture room. Without subordinating the true educa-

tional function of these methods, work is so carried on as to give the student intelligent preparation for similar work after graduation.

The visits of inspection, in which the students are accompanied by members of the faculty, and the reports thereon are considered very important in developing correct methods of observation, note taking, and description; in forming acquaintance with engineering works and industrial processes; and in bringing students in contact with business men and with engineers engaged in the practice of their profession.

Examinations are held at the close of each term.

The college is well supplied with the necessary instruments, machines, and tools for laboratory, field, and shop-work. The equipment is of the best quality and is yearly being increased. The Department has a working library, kept up to date, containing standard works in all branches of civil engineering. It is supplied, also, with the leading professional and other scientific periodicals, both American and foreign. Students are encouraged and taught to avail themselves of current technical matter in foreign languages as well as in their own.

The Department is in complete and successful operation. The training is thorough and the instruction such as to meet the demands of life. About three-fourths of those who have completed this course are engaged in professional work, in which they are making rapid advancement. Those graduates who have not entered the engineering profession are pursuing, with success, teaching, law, and business careers.

In regard to obtaining situations it may be said that frequently students have been able to engage themselves, during their long vacations, in engineering work; and some have, in this way, secured permanent positions to be occupied at the completion of the course. While the opportunities are largely determined by industrial conditions, our instructors and alumni are always alert in

assisting graduates to obtain positions and to make professional advancement.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Mathematics, 16	4	4	Mathematics, 17	4	4
Civil Engineering, 14	2	1	Civil Engineering, 14	2	1
Chemistry, 1	3	3	Chemistry, 1	3	3
Mechanical Engineering, 20	2	2	Mechanical Engineering, 20	2	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
History, 2	1	1	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Mathematics, 10	3	3	Chemistry, 4	3	1.5
Chemistry, 3	3	1.5	Physics, 1	3	3
Physics, 1	3	3	Physics, 3	2	1
Physics, 3	2	1	Civil Engineering, 15	4	3
Civil Engineering, 15	4	3	Mechanical Engineering 22	3	1.5
Mechanical Engineer-, ing, 22	3	1.5	Electrical Engineering, 9	2	2
Military Science, 2	3	1.5	Military Science, 2	3	1.5
Physical Training, 2	1	0 5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Mineralogy, 1.....	3	3	Mineralogy, 2	3	3
Bacteriology, 2	1	1	Bacteriology, 2	2	1
Civil Engineering, 2 ..	2	1	Civil Engineering, 2..	2	1
Civil Engineering, 6..	3	3	Civil Engineering, 7a.	3	3
Civil Engineering, 16	5	3.5	Civil Engineering, 8 ..	2	2
Electrical Engineering, 11	2	2	Civil Engineering, 16..	5	3.5
Military Science, 3....	3	1.5	Mechanical Engineering, 1, ...	3	3
			Military Science, 3....	3	1.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	Civil Engineering, 1..		
Civil Engineering, 1..			Civil Engineering, 2 ..	4	4
Civil Engineering, 3...	4	4	Civil Engineering, 4 ..	4	4
Civil Engineering, 4..	4	4	Civil Engineering, 5 ..	2	2
Civil Engineering, 5...	3	3	Civil Engineering, 9a .	4	4
Civil Engineering, 9..	4	4	Civil Engineering, 12 ..	3	3
Civil Engineering, 13..	3	1.5	Civil Engineering, 13 ..	3	1.5
Military Science, 4....	3	1.5	Military Science, 4....	3	1.5
Options—One to be taken			*Options—One to be taken*		
Civil Engineering, 7a, 7b, 7c	5	3.5	Civil Engineering, 7a, 7b, 7c	5	3.5
Civil Engineering, 11..	3	3	Civil Engineering, 10..	3	3
			Elective		
			English, 7	1	1

MECHANICAL AND ELECTRICAL ENGINEERING

This department offers two courses, one in Mechanical Engineering and one in Electrical Engineering, each leading to the degree of Bachelor of Science. The courses are designed to teach the principles of Mechanical and Electrical Engineering and to train young men to meet successfully the problems which an engineer may encounter. Besides offering instruction in purely technical studies, the courses also provide the elements of a liberal education, including the subjects of English Composition, oral and written, English Literature, History, French or German, Mathematics, Physics, and Chemistry.

Both courses are the same for the first three years. During the fourth year, students who take one course or the other pursue separately the subjects pertaining to their particular course. Many studies, however, remain common to both courses.

The department has a well-equipped wood-working and machine shop and mechanical and electrical laboratories and drafting-room. Furthermore, besides the regular afternoon periods of shopwork, there is a supplementary term in Sophomore shopwork, which will begin on June 15, 1916, and will last for two weeks.

Students are charged a moderate fee for shop and laboratory courses, which fee is intended to cover the cost of materials used and to meet incidental expenses.

Students are required to furnish all instruments and materials used in the drafting-room. The materials must conform strictly to the requirements of the department, and the instruments must meet with the approval of the instructor.

Every candidate for graduation is required to present a satisfactory thesis which shall embody the results of some investigation which he has personally made. These theses must be typewritten and must be accompanied by such drawings and other sheets as are necessary to illustrate and explain the subject. The theses must be ap-

proved by the English Department before they will be accepted.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Mathematics, 16	4	4	Mathematics, 17	4	4
Chemistry, 1	3	3	Chemistry, 1	3	3
Civil Engineering, 14	2	1	Civil Engineering, 14	2	1
Mechanical Engineering, 20	2	2	Mechanical Engineering, 20	2	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
History, 2	1	1	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Mathematics, 10	3	3	Physics, 1	3	3
Physics, 1	3	3	Physics, 3	2	1
Physics, 3	2	1	Chemistry, 4	3	1.5
Chemistry, 3	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 41	3	1.5	Mechanical Engineering, 41	3	1.5
Mechanical Engineering, 43		3	Electrical Engineering, 9	2	2
Military Science, 2	3	1.5	Military Science, 2	3	1.5
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Civil Engineering, 2	2	1	Civil Engineering, 2	2	1
Civil Engineering, 6	3	3	Mechanical Engineering, 1	3	3
Mechanical Engineering, 24	4	4	Mechanical Engineering, 24	4	4
Mechanical Engineering, 42	3	1.5	Mechanical Engineering, 42	3	1.5
Electrical Engineering, 1	2	2	Electrical Engineering, 2	2	2
Electrical Engineering, 30	3	2.5	Electrical Engineering, 30	3	1.5
Military Science, 3	3	1.5	Military Science, 3	3	1.5

SENIOR YEAR—MECHANICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Mechanical Engineering, 3	2	2	Mechanical Engineering, 3	2	2
Mechanical Engineering, 4	4	4	Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1	Mechanical Engineering, 6	1	1
Mechanical Engineering, 9	1	1	Mechanical Engineering, 9	1	1
Mechanical Engineering, 25	6	3	Mechanical Engineering, 25	6	3
Mechanical Engineering, 30	6	3	Mechanical Engineering, 30	6	3
Electrical Engineering, 10	1	1	Electrical Engineering, 10	1	1
Electrical Engineering, 3	4	4	Electrical Engineering, 3	4	4
Electrical Engineering, 32	3	1.5	Electrical Engineering, 32	3	1.5
Military Science, 4	3	1.5	Military Science, 4	3	1.5

SENIOR YEAR—ELECTRICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Mechanical Engineering, 4	4	4	Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1	Mechanical Engineering, 6	1	1
Mechanical Engineering, 31	3	1.5	Mechanical Engineering, 31	3	1.5
Electrical Engineering, 3	4	4	Electrical Engineering, 3	4	4
Electrical Engineering, 5	1	1	Electrical Engineering, 5	1	1
Electrical Engineering, 8	1	1	Electrical Engineering, 8	1	1
Electrical Engineering, 10	1	1	Electrical Engineering, 10	1	1
Electrical Engineering, 20	6	3	Electrical Engineering, 20	6	3
Electrical Engineering, 31	6	3	Electrical Engineering, 31	6	3
Military Science, 4	3	1.5	Military Science, 4	3	1.5

CHEMICAL ENGINEERING

The course in Chemical Engineering is designed to give thorough instruction in Chemistry and also in some of the more important engineering branches. In addition to the general instruction in Chemistry it includes special work in chemical analysis, organic preparations, electro-analysis, industrial chemistry, with the analysis of some of the more important materials and products, water analysis, and gas analysis. It also includes such branches of mechanical and electrical engineering as are particularly useful in the management of manufacturing establishments. Aside from its special purpose this course offers an excellent scientific education. Every candidate for graduation will be required to prepare in his Senior year a thesis giving the results of his own investigations of some approved subject. This course leads to the degree of Bachelor of Science in Chemical Engineering.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 10	3	3	Modern Language, 10	3	3
Mathematics, 16	1	1	Mathematics, 17	4	4
Mechanical Engineering, 20	2	2	Mechanical Engineering, 20	2	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
Chemistry, 1	3	3	Chemistry, 1	3	3
History, 2	1	1	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 11	3	3	Modern Language, 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Mathematics, 10	3	3	Physics, 1	3	3
Physics, 1	3	3	Physics, 3	2	1
Physics, 3	2	1	Chemistry, 2	3	3
Chemistry, 2	3	3	Chemistry, 4	3	1.5
Chemistry, 3	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 41		1.5	Electrical Engineering, 9	2	2
Mechanical Engineering, 43		3	Physical Training, 2	1	0.5
Military Science, 2	3	1.5			
Physical Training, 2	1	0.5			

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Chemistry, 5	3	3	Chemistry, 5	3	3
Chemistry, 6	3	1.5	Chemistry, 7	6	3
Chemistry, 9	1	1	Mineralogy, 2	3	3
Chemistry, 11	3	1.5	Mechanical Engineering, 1	3	3
Mineralogy, 1	3	3	Electrical Engineering, 2	2	2
Electrical Engineering, 1	2	2	Military Science, 3	3	1.5
Military Science, 3	3	1.5			

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Chemistry, 8	3	3	Chemistry, 10	12	6
Chemistry, 10	12	6	Chemistry, 12	4	2
Chemistry, 13	2	1	Chemistry, 14	2	1
Chemistry, 14	2	1	Chemistry, 15	3	3
Chemistry, 15	3	3	Military Science, 4	3	1.5
Military Science, 4	3	1.5			
Optionals (From non-technical subjects)	3	3	*Optionals* (From non-technical subjects)		3

ADVANCED DEGREES

The degree of Master of Arts or Master of Science will be awarded upon the satisfactory completion of a resident course of study in Arts, Science, Agriculture, or Engineering extending over not less than one year. The candidate must have taken his first degree in some college of approved standing and must show by his previous record that he is capable of doing satisfactory work for the advanced degree. At the beginning of the year in which he expects the degree he shall select a major subject and one or two minor subjects and he shall take in these subjects the equivalent of at least 12 hours work. He must also attain a high standard of scholarship.

The examination for the Master's Degree may be oral or written, at the option of the professor in charge. In

all cases a meritorious thesis must be submitted in the major subject.

A graduate of any of the courses in Engineering will, after three years of practical and successful work as an Engineer, be entitled to the professional degree of C. E., M. E., E. E., or Ch. E., according to the course he may have pursued. One college year before coming up for the degree the candidate must signify his intention, and also map out a definite and satisfactory course of work. He must in addition submit a satisfactory subject for a thesis. The examination, held at Delaware College, will cover the work mapped out and the thesis.

In exceptional cases students may do the actual work for the Master's Degree **in absentia** under conditions determined by the committee on Graduate Study.

An incidental fee of $10 must be paid by the candidate for a higher degree before he will be admitted to the final examinations.

Two copies of all theses submitted for degrees must be left with the college as its property.

SUBJECTS OF INSTRUCTION

By Departments

In this detailed statement of the subjects of instruction, the number of credit term hours is printed in italics at the end of each course. If the actual hours of recitation, lecture, and laboratory work differ from the credit hours, the number of actual hours is stated immediately before the credit hours.

Two hours of laboratory work are counted as equivalent to one lecture or recitation hour.

Courses are full-year courses, except as especially noted.

AGRICULTURE

A1 Elementary Agriculture. The aim of this course is to present the scope of the various fields of agricultural activity. It is given under the direction of the departments of Agronomy, Animal Husbandry, and Horticulture.

Required of all Freshmen in Agriculture. One lecture and two laboratory hours a week.

Two credit hours

AGRONOMY

PROFESSOR GRANTHAM AND ASSISTANT PROFESSOR LINTNER

Agronomy is the science of the field, the soil, and its crops.

The soil is studied with reference to its functions as the home of the plant. The fundamental principles of soil management for crop production are especially emphasized. The study of soils presupposes a fair understanding of the principles of physics, chemisty, and plant physiology.

Field crops are studied from the standpoint of the adaptation, and improvement of plants. A study is made of the economical and business management of the field and its crops. The study of field crops presupposes a general knowledge of botany.

A field of twenty-five acres devoted to experimental and research work in Agronomy is used to supplement class and laboratory work. At least one visit to representative farms of the State will be required of Juniors and Seniors in Agronomy.

AGR 1 Field Crop Production. A general course dealing with the history, adaptation, distribution, and classification of cereal and forage crops. Special attention is given to the principles of cultivation, and to the methods of harvesting and marketing which obtain under Eastern conditions. Lectures, recitations, and laboratory work. First term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

AGR 2 Cereal Crops. (Prerequisites: Agr 1; B 4). The cultivation, harvesting, and marketing of grain crops. Attention in detail is given to the various methods of production and to the cost. Varieties and types of grain groups are considered, together with the principles of im-

provement by selection and breeding. Judging of corn, wheat, oats, etc., and a study of market grades and classification; preservation and testing of field crop seeds. Lectures, recitations, and laboratory work. Second term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

AGR 3 Forage Crops. (Prerequisites: Agr 1; B 4). A study of the various types and varieties of grasses and leguminous crops used for hay and pasture. Special attention is given to cultural methods, propagation, and value of the various plants for feed and soil improvement. Lectures, recitations, and laboratory work. First term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

AGR 4 Soil Fertility. (Prerequisites: C 1, Ps 1, 2). A study of the origin, formation, classification, and function of soils, the relation of soil texture to temperature, air, and moisture, and to plant growth; the effect of methods of tillage and drainage on the physical properties of soils. Lectures, recitations, and laboratory work. First term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 5 Soil Fertility. (Prerequisites: C 1, 2, 3, 4, and 5; Agr 4). The relation of plant food to the productive capacity of the soil and a study of the methods by which the fertility may be obtained and increased. The ultimate effect of various rotations and of different systems of farming on the fertility of soils. A study of the composition of manures, fertilizers, and amendments, with a comparison of their agricultural and commercial value for different crops. Lectures, recitations, and laboratory work. Second term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 6 Farm Equipment. Laying out the fields; the location, arrangement, design, construction, and cost of farm buildings, especially barns, granaries, silos, etc.; the adaptability, efficiency, construction, operation, and durability of field machinery; power machinery includ-

ing steam and gasoline engines; the different kinds of fences, cost, construction, and durability; construction of roads, walks, and drains. Lectures, recitations, and practice work. First term.

ASSISTANT PROFESSOR LINTNER *Three credit hours*

AGR 7 Farm Management. This course is designed to summarize the student's agricultural training and experience and apply it to the efficient management of the farm as a whole. The organization of the farm as a business enterprise, its arrangement with reference to size and shape of field; systems of crop and livestock management; the relation of fixed to circulating capital; the relation of labor to income; farm accounts, etc. Lectures and seminars. Second term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 8 Plant Breeding. (Prerequisites: Agr 2, 3, 4, 5; Hort. 14). The improvement and breeding of field crops including the grains, grasses, and legumes; selection; results obtained by various investigators. Lectures, assigned reading, demonstrations, and laboratory work. Second term.

PROFESSOR GRANTHAM *Two credit hours*

AGR 9 Investigation of Special Soils. (Prerequisites: C 5, 6, 7; Agr 4 and 5). The determination of the nature and quantity of the elements of fertility; effect upon various crops of different fertilizers added to soils, as determined by pot culture and pot experiments; systematic study of similar work of experiment stations and investigators. Assigned readings, reviews, and laboratory work. First term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 10 Methods of Field Experimentation. (Prerequisites: Agr 2, 3, 4, 5, 8, 9). A course designed for students intending to take up experiment station work. Methods of plotting land for soil and crop experiments;

check systems; interpretation of results. The literature of this and other countries pertaining to experimental work will be carefully studied.

PROFESSOR GRANTHAM *One credit hour*

AGR 11 Thesis and Seminar. Original work on an approved line of investigation.

PROFESSOR GRANTHAM *Three credit hours*

ANCIENT LANGUAGES AND LITERATURES

PROFESSOR CONOVER

Throughout the course the aim is to enable the student to acquire facility and quickness in reading at sight and familiarity with the ancient order of thought. Word-meaning is fixed by inspecting form, derivation, and comparison with synonyms. The authors are selected with a view to their representative character. The public and private life of the Greeks and Romans and their influence on modern literature and civilization are continually kept before the minds of the students. English derivatives and words kindred to all Indo-European tongues are frequently noted, and the general principles of comparative philology are explained and applied.

In addition to the department library, which contains the Delphini edition of Latin writers, the Attic orators and dramatists, etc., the department of classical philology in the general library is steadily growing. It contains bound volumes of the American Journal of Philology and of the Harvard Studies in Classical Philology. The American Journal of Philology is kept on file in the reading room.

LATIN

AL 1 Cicero, De Senectute and De Amicitia. Ovid, Metamorphoses, etc. Prose Composition.

Three credit hours

AL 2 Livy, 21st or 22d book. Horace, Odes, Epodes, Satires, Epistles. Prose Composition.

Three credit hours

AL 3* Tacitus, Germania and Agricola. Plautus, Captives and Trinummus. Juvenal, Satires.

Three credit hours

AL 4* Seneca, Tragedies or Moral Essays. Terence, Adelphoe and Andria. Quintilian, Books X and XII. Lectures on Latin Literature and Inscriptions.

Three credit hours

GREEK

AL 5 White's First Greek Book. Anabasis, I, II.

Three credit hours

AL 6 Anabasis III, IV, Homer, Iliad, I-III.. Herodotus VII, VIII.

Three credit hours

AL 7* Lysias, Orations. Plato, Apology and Crito. Aristophanes, Plutus or Clouds.

Three credit hours

AL 8* Demosthenes, Orations. Lucian, Dialogues. Aeschylus, Prometheus Bound.

Three credit hours

AL 9* Greek Prose Composition.

Two credit hours

AL 10* Greek Testament.

Two credit hours

ANIMAL HUSBANDRY

PROFESSOR HAYWARD AND ASSISTANT PROFESSOR HILLS

The work in Animal Husbandry is designed to familiarize the student with some of the principles underlying this important industry. The class room and laboratory instruction is supplemented by work with the live stock on the College Farm and by visits to the many flocks, herds, and studs of Delaware and Pennsylvania as well as by attending some of the best live stock shows which are held annually within easy reach from the college.

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*Given in alternate years

AH 1 Types and Market Classes of Farm Animals. A study of the development of the types of farm animals, the characteristics of the breeds within the types and the relation of market requirements to the live stock industry. Laboratory practice in the judging and selecting of the various classes and in the simple handling of farm animals will supplement the class room work. It will also include practice in the cutting and curing of meats. Two lectures and two laboratory hours a week. First term.

ASSISTANT PROFESSOR HILLS *Three credit hours*

AH 2 Types and Market Classes of Farm Animals. A continuation of AH 1. Two lectures and two laboratory hours a week. Second term.

ASSISTANT PROFESSOR HILLS *Three credit hours*

AH 3 Feeding Farm Animals. The principles of animal nutrition; the composition and qualities of feeding stuffs; the feeding of horses and a brief survey of the feeding of dairy cattle and swine. Two laboratory and two lecture hours a week. First term.

ASSISTANT PROFESSOR HILLS *Three credit hours*

AH 4 Feeding Farm Animals. (Prerequisite: AH 3). A continuation of AH 3, dealing with the feeding of beef and dairy cattle, sheep, and swine. Two lectures and two laboratory hours. Second term.

ASSISTANT PROFESSOR HILLS *Three credit hours*

AH 5 Advanced Judging. (Prerequisites: AH 1 and 2). The aim of this course is to train students in the selection of desirable sires and breeding females and for judging at fairs. The men who will represent the college in judging contests will be chosen largely from this class. Several of the excellent stock farms within a radius of fifty miles will be visited. Four laboratory hours a week. Second term.

PROFESSOR HAYWARD AND ASSISTANT PROFESSOR HILLS
Two credit hours

AH 6 Breeds of Farm Animals. (Prerequisites: AH 1 and 2). A comprehensive study of the development of the breeds of live stock, the most noted sires and dams of the breeds, and the most successful lines of breeding. One lecture and four laboratory hours a week. First term.

PROFESSOR HAYWARD AND ASSISTANT PROFESSOR HILLS

Three credit hours

AH 7 Live Stock Management. (Prerequisites: AH 1, 2, 3, and 4). The care, handling, and management of animals for market, show, and farm purposes. Considerable practice work with the animals on the college farm will be required. One lecture and four laboratory hours a week. First term.

ASSISTANT PROFESSOR HILLS *Three credit hours*

AH 8 Animal Breeding. (Prerequisites: AH 6 and Hort 14). A presentation of the more practical phases of heredity, variation, correlation, prepotency, and environment, and of their application to the breeding of farm animals. Second term.

PROFESSOR HAYWARD *Two credit hours*

AH 9 Seminar. A weekly conference of those majoring in Animal Husbandry, with reports and discussions of current literature and activities pertaining to the live stock industry. Senior year. First term.

PROFESSOR HAYWARD AND ASSISTANT PROFESSOR HILLS

One credit hour

AH 10 Seminar. A continuance of AH 9. Senior year. Second term.

PROFESSOR HAYWARD AND ASSISTANT PROFESSOR HILLS

One credit hour

AH 11 Feeds and Feeding. This course is designed for students taking the Two Years' Course in Agriculture. Its aim is to give a general view of the practical feeding of farm animals. Required of students in the Two Years' Course. This course will not be offered after the collegiate year of 1916-1917. First term.

ASSISTANT PROFESSOR HILLS *Three credit hours*

BACTERIOLOGY AND HYGIENE

PROFESSOR REED

Ba 1 Bacteriology. Instruction in this subject will be given in the form of lectures, recitations, and laboratory work. It will consist of a study of morphology, biological characters, distribution and classification of bacteria, and the relation of bacteria to animal and plant life. In the laboratory the student will be instructed in the technique necessary for practical work in bacteriology, cleaning and sterilizing apparatus, making culture media, isolating and studying bacteria in cultures and under the microscope both in the living condition and in stained preparations. Both saprophytic and pathogenic organisms will be studied. Required of Juniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

Three credit hours

Ba 2 Hygiene. Instruction in this subject will be given by means of lectures and laboratory work, and will cover the principles of sanitation, the prevention of epidemics, and disinfection. Required of Juniors in Civil Engineering and elective for Juniors and Seniors in Arts and Science.

One credit hour

Ba 3 Animal Hygiene. The object of this course is to study the methods of preserving the health of farm animals. Instruction in this subject will consist of lectures, recitations, and demonstrations. Elective for Seniors in Agriculture. Second term.

Three credit hours

Ba 4 Bacteriology. This course is for special students in agriculture. The relation of bacteria to animal and plant life and the principles of sterilization and disinfection will be emphasized. First term.

Two credit hours

Ba 5 Bacteriology. A research course. Laboratory work. Open to students who have taken Bacteriology 1.

Three to five credit hours

BIOLOGY

PROFESSOR HOUGHTON

The aim of biological instruction is to give the student some knowledge of the various living things by which he is surrounded, as well as to develop habits of careful observation and comparison, and close and accurate methods of thinking.

Most of the time is spent in actual study in the laboratory, which is supplied with simple and compound microscopes, reference works, microtome, reagents, etc. There is also an excellent collection of illustrative specimens and charts.

B 1 Elementary Zoology. A study of the variations in the structure and life history of the different classes of animals, their habits and relations. The student secures a general knowledge of the principles of classification based upon the evolution of the animal kingdom, and the principles of Zoology. Selected types of the principal groups of animals from Protozoa to Mammalia, of which dissections, drawings, and notes are required, are studied in the laboratory. The course gives a comprehensive view of the science of Zoology to the student taking no further work, and forms a basis for advanced work. One recitation or lecture and four hours of laboratory work a week. Required of Juniors in Agriculture. Elective for Arts and Science students.

Three credit hours

B 2 Systematic and Economic Zoology. (Prerequisite: B 1). In this course the student becomes acquainted with a large number of our common vertebrates and learns something of their structure, life histories, habits, and economic importance. Much attention is given to the work of tracing typical specimens, representing as many groups as possible, of Fishes, Batrachians, Reptiles, Birds, and Mammals, by means of keys which are based largely upon structural characters. Thus the student gains a clear

idea of the relation of forms and the characters upon which classifications are based. Dissections are made when necessary to understand and properly use the keys. Four hours laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Two credit hours

B 3 Economic Entomology. A course treating of the more important injurious insects of orchard, garden, and field crops, also the insect pests of domestic animals and the household. The work deals with their structure, life histories, and descriptions, and the most approved methods for their control. The most important forms are placed before the class for careful examination and comparison. Special emphasis is laid upon the necessity for the ready determination of species. Two recitations or one recitation and two hours of laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Two credit hours

B 4 General Botany. As is indicated by its title, this is a general course in botany which aims to give the student a comprehensive idea of the subject as a whole. The topics to which particular attention is given in the first term are as follows: seeds and seedlings; roots, stems, and leaves; the morphology, evolution, and taxonomy of the Thallophyta, Bryophyta, and Pteridophyta. In the second term the principal topics are as follows: the Gymnospermae; winter buds; the flower and fruit of the higher seed plants; the morphology and taxonomy of the Angiospermae; ecology and economic botany. One recitation or lecture and four hours of laboratory work a week. Required of Freshmen in Agriculture. Elective for Arts and Science students.

Three credit hours

B 5 Plant Pathology. (Prerequisite: B 4). This is an elementary course in plant pathology, covering the principal bacterial and fungous diseases of our more im-

portant economic plants, with methods of control. An effort is made to have the course as practical as possible, special emphasis being placed upon the ability of the student to recognize or determine important plant diseases. Some attention is also given to culture methods and technique. Four hours of laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Two credit hours

CHEMISTRY

PROFESSOR PENNY, ASSISTANT PROFESSOR TIFFANY, AND DR. PUTNAM

For students not seeking special preparation in chemistry, courses are offered in inorganic and organic chemistry, qualitative and quantitative analysis, and agricultural chemistry.

The instruction is given in lectures with experiments and by means of laboratory work. The time given to the subject and the courses taken vary with the general course of study pursued by the individual student.

A library of the standard works and a file of the principal journals are accessible to students.

C 1 Inorganic Chemistry. This course treats of the elements and their more important compounds with special reference to industrial uses. Recitations and lectures.

PROFESSOR PENNY *Three credit hours*

C 2 Organic Chemistry. (Prerequisite: C 1). This course treats of the more important carbon compounds. Recitations and lectures.

DR. PUTNAM *Three credit hours*

C 3 Introductory Qualitative Analysis. (Prerequisite: C 1). This course is devoted chiefly to laboratory practice in the detection and separation of bases and acids. First term. Three hours of laboratory and one-half hour of lectures.

ASSISTANT PROFESSOR TIFFANY AND DR. PUTNAM

One and a half credit hours

C 4 Introductory Quantitative Analysis. (Prerequisites: C 1 and 3). This course consists of laboratory work. After preliminary practice, such branches of analysis are studied as are thought to be best adapted to the needs of each student. Second term. Three hours of laboratory and one-half hour of lectures.

ASSISTANT PROFESSOR TIFFANY AND DR. PUTNAM
One and a half credit hours

C 5 Agricultural Chemistry. (Prerequisites: C 1 and 2). This course treats of the chemistry of plant life, of soils, of fertilizers, of feeding stuffs, and of spray materials. Lectures.

PROFESSOR PENNY *Three credit hours*

C 6 Qualitative Analysis. (Prerequisites: C 1 and 3). This course is supplementary to Course 3, which is a prerequisite; it is intended for students desiring a more thorough knowledge of the subject. First term. Three hours.

ASSISTANT PROFESSOR TIFFANY *One and a half credit hours*

C 7 Quantitative Analysis. (Prerequisites: C 1, 3, 4). This course is supplementary to Course 4, which is a prerequisite. It will be adapted as far as possible to the needs of individual students. Six hours.

ASSISTANT PROFESSOR TIFFANY *Thre credit hours*

C 8 Industrial Chemistry. (Prerequisites: C 1 and 2). This course treats of the chemistry of several of the more important industrial processes. First term.

PROFESSOR PENNY *Three credit hours*

C 9 Chemical Calculations. First term.

PROFESSOR PENNY *One credit hour*

C 10 Technical Analysis. (Prerequisites: C 1, 3, 4). This is a laboratory course intended for special students of Chemistry. It treats of the analysis of industrial materials and products. Twelve hours.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY
Six credit hours

C 11 Organic Analysis and Organic Preparations. (Prerequisites: C 1, 2, 3, and 4). This is a laboratory course; it includes elementary organic analysis and the preparation of some of the more important organic compounds. Three hours. First term.

DR. PUTNAM *One and a half credit hours*

C 12 Water Analysis. (Prerequisites: C 1, 3, and 4). A laboratory course in the analysis of potable water and of water for industrial uses. Four hours. Second term.

DR. PUTNAM *Two credit hours*

C 13 Gas Analysis. (Prerequisites: C 1, 2, 3, and 4). A laboratory course in the analysis of illuminating gas, and the like. Two hours. First term.

PROFESSOR PENNY *One credit hour*

C 14 Electro-analysis. (Prerequisites: C 1, 3, and 4). A laboratory course in the determination of metals by electrolytic methods. Two hours. Second term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY *One credit hour*

C 15 Electrochemistry. This course treats of electricity in its relation to chemistry with special application to industrial processes. Recitations and lectures. *Three credit hours*

C 16 Thesis. Original work on an approved subject. Senior year.

AGRICULTURAL CHEMISTRY

PROFESSOR THOMPSON AND ASSISTANT PROFESSOR WHITTIER

The courses in Agricultural Chemistry are designed to instruct the student in the nature and properties of materials pertaining to agriculture as well as in the nature of the chemical changes taking place in agricultural and physiological processes. He is also instructed in the proper interpretation of chemical analyses, being thereby enabled to judge the quality of many materials and estimate their value.

AC 1 Agricultural Chemistry. (Prerequisites: C 1, 2, 3, and 4). The chemistry of soils, fertilizers, feeding stuffs, dairy products,insecticides. Lectures, recitations, and laboratory work. Required of students in Agriculture.

Three credit hours

AC 2 Advanced Agricultural Chemistry. Plant Chemistry. (Prerequisite: AC 1). The chemistry of the plant products. The function of the mineral plant foods in plant Metabolism. The composition of plants at different stages of growth with special reference to the organic constituents. Use of the Polariscope. The action of enzymes, etc. Lectures, recitations, and laboratory. Elective. Second term. (Omitted in 1916-17).

Three credit hours

AC 3 Advanced Agricultural Chemistry. Animal Chemistry. (Prerequisite: AC 1). The chemistry of the animal body. Composition of foods and the chemical changes taking place during digestion. Use of calorimeter in determining energy values of foods. Chemistry of immunity, etc. Lectures, recitations, and laboratory. Elective. Second term. (Omitted in 1916-17).

Three credit hours

CIVIL ENGINEERING

PROFESSOR ROBINSON, PROFESSOR SHORT, AND ASSISTANT PROFESSOR PRESTON

CE 1 Thesis. Each Senior student in civil engineering must prepare as a thesis, with such drawings as are necessary for its proper elucidation, a written description of some structure, machine, or process which he may have examined or designed. Not later than the first day of May next preceding the date of the student's graduation, the description and drawings, which will be re-

tained by the college, must be presented to the Professor in charge of the course.

CE 2 Graphic Statics. (Prerequisites: M 2 and 10). Co-planar forces, concurrent and non-concurrent; friction; center of gravity; moment of inertia; simple trusses; problems. Recitations, lectures, and drawing. Required of Juniors in Engineering except in Chemical Engineering. Two hours a week.

PROFESSOR ROBINSON *One credit hour*

CE 3 Hydromechanics. (Prerequisite: M 11). Hydrostatics; flow of water through orifices and tubes; flow in pipes, conduits, and natural channels; hydraulic machinery; pneumatics. Recitations and lectures. Required of Seniors in Civil Engineering.

PROFESSOR SHORT *Four credit hours*

CE 4 Mechanics of Materials. (Prerequisites: M 7 and 11; Ps 1 and 3; CE 2). Theory of elasticity; simple stresses; strength of pipes and riveted joints; strength and stiffness of beams and of columns and shafts; resilience of materials. Investigation and design. Properties and structural forms of iron and steel. Recitations, lectures, and laboratory. Required of Seniors in Engineering except in Chemical Engineering.

PROFESSOR ROBINSON *Four credit hours*

CE 5 Masonry. (Prerequisites: M 11; Ps 1 and 3). Properties of building stones; preparation of natural stone; manufacture of artificial stones; manufacture and use of limes, cements, mortars, and concrete; foundations; superstructures; stability of masonry structures. Recitations, lectures, laboratory, and visits of inspection. Required of Seniors in Civil Engineering.

PROFESSOR ROBINSON

First term, three credit hours; second term, two credit hours

CE 6 Building Construction. (Prerequisites: M 10; Ps 1 and 3). Materials and their use in construction of buildings; paints and varnishes; framing of floors, parti-

tions, and roofs; fire-proofing, mill-work, and tall building construction; sketching; computing quantities and estimating. Recitations, lectures, and visits to structures. Required of Juniors in Engineering except in Chemical Engineering. First term.

PROFESSOR ROBINSON *Three credit hours*

CE 7 Framed Structures. a Algebraic Methods. b Graphic Methods. c Design. (Prerequisites: M 7 and 11; CE 2). Lecture on the construction of the common type of trusses; stresses in the common forms of roof and bridge trusses by algebraic methods; stresses in framed structures by graphic method; elementary problems in investigating and design; principles involved and methods employed in designing, constructing, and erecting framed structures. Recitations, lectures, drawing, and visits to bridge works. Required of Juniors in Civil Engineering. Second term.

Three credit hours

Optional with Seniors in Civil Engineering. Five hours.

PROFESSOR ROBINSON *Three and one-half credit hours*

CE 8 Highways. (Prerequisite: CE 15). Location, construction, and maintenance of roads, streets, and pavements, including study of tractive forces and of the properties of road materials. Recitations and lectures. Required of Juniors in Civil Engineering. Second term.

PROFESSOR SHORT *Two credit hours*

CE 9 Railroads. a Theory. b Practice. (Prerequisites: M 2; CE 15 and 16). Reconnaissance, preliminary and location surveys, curves, slope-stakes, earthwork and structures; track-work, maintenance, operation; economic theory of location. Recitations, lectures, fieldwork, and office-work. Required of Seniors in Civil Engineering.

PROFESSOR ROBINSON *Four credit hours*

CE 10 Water Supply. Requisites of a supply; source; construction and maintenance of systems for col-

lecting, storing, purifying, and distributing water. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering. Second term.

PROFESSOR SHORT *Three credit hours*

CE 11 Sewerage. Different systems for the removal of sewage; design, construction, and maintenance of sewers; individual sewers; sewer appurtenances; disposal and utilization of sewage. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering. First term.

PROFESSOR SHORT *Three credit hours*

CE 12 Contracts. Specifications. Business Law. Contracts; specifications; property; negotiable instruments; agency; partnership; insurance; carriers. Recitations and lectures. Required of Seniors in Civil Engineering. Second term.

PROFESSOR ROBINSON *Three credit hours*

CE 13 Engineering Laboratory. Study of Construction and use of testing apparatus, including testing machines and attachments; examinations and tests of structural materials; discussion of results; preparation of reports. Required of Seniors in Civil Engineering. Three hours.

PROFESSOR ROBINSON *One and one-half credit hours*

CE 14 Surveying. Study of the compass, transit, and level, their uses and adjustments; use of chain in land surveys; computations in land surveys. Recitations and field work. Required of Freshmen in Engineering except in Chemical Engineering. Two hours.

ASSISTANT PROFESSOR PRESTON *One credit hour*

CE 15 Surveying. (Prerequisite: CE 14). Principles; problems; use of chain, compass, level, and transit; theory of construction and use of instruments; land surveying with transit; survey of public lands of the United State; topographical surveying; city, hydrographic, and mine surveying; functions of the surveyor; principles for guidance in original surveys and resurveys; adjustment

of observations by method of least squares; theory of construction and use of barometer; plotting and computations from students' own field-notes, involving use of various office instruments. Recitations, lectures, field-work, and office-work. Required of Sophomores in Civil Engineering. Four hours.

ASSISTANT PROFESSOR PRESTON *Three credit hours*

CE 16 Surveying. (Prerequisite: CE 15). Circular curves; theory and use of stadia; plane table topographical surveying and drawing; computation of earthwork; setting slope-stakes; complete topographical survey of a tract of land and location of an industrial spur track; mapping; mathematical astronomy for field use; determination of latitude, azimuth, time, and longitude; use of sextant and solar transit,—day and night observations. Recitations, lectures, field-work, and office-work. Required of Juniors in Civil Engineering. Five hours.

ASSISTANT PROFESSOR PRESTON *Three and one-half credit hours*

DAIRYING

ASSISTANT PROFESSOR HILLS

The dairy interests of Delaware are not large, and are confined principally to the production of milk for the city markets. The courses of instruction in this subject are planned to acquaint the students with the whole field, and after the year 1915-1916 facilities will be provided for practical courses in butter, cheese, and ice cream-making as well as in the production and preparation of milk for direct consumption.

Studies will also be made of the local commercial milk plant and of some of the large centralized plants of adjoining cities.

D 1 The work in dairying consists of a study of the production, care, and sale of high class market milk, farm dairy butter, and dairy inspection. A practice course in milk testing, separating, etc., will be required of each student. Observation trips will be made to some of the cer-

tified milk dairies and large market milk establishments in the vicinity of Philadelphia. One lecture and four laboratory hours a week. Second term.

Three credit hours

ELECTRICAL ENGINEERING

PROFESSOR KOERBER AND MR. HILLEGASS

EE 1 Direct Currents. Theory of the direct current dynamo; shunt, series, and compound wound field magnets; ring and drum windings; commutators; direct current motors. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. First term.

MR. HILLEGASS *Two credit hours*

EE 2 Direct Currents. Operation, regulation, and methods of testing dynamos and motors. Study of motor and dynamo characteristics. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. Second term.

MR. HILLEGASS *Two credit hours*

EE 3 Alternating Currents. Inductance and capacity; harmonic electromotive force; single phase and polyphase circuits; alternating current instruments and machinery. Theory of single phase and polyphase induction motors; induction generators; synchronous motors and converters; and single phase commutator motors. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR KOERBER *Four credit hours*

EE 5 Electrical Engineering Seminary. Papers on assigned topics; lectures on recent advances in electrical engineering; discussion of thesis work; discussion of articles in current engineering periodicals. Required of Seniors in Electrical Engineering.

PROFESSOR KOERBER *One credit hour*

EE 8 Telephones and Telegraphs. A study of modern telephone systems with a review of the earlier

systems and developments. Required of Seniors in Electrical Engineering.

MR. HILLEGASS *One credit hour*

EE 9 Electricity and Magnetism. Fundamental principles of electricity and magnetism. Required of all Sophomores in Engineering. Second term.

MR. HILLEGASS *Two credit hours*

EE 10 Direct Currents. Direct current distribution; calculation of high and low tension lines; electric lamps and photometry; details of outside wiring, with particular reference to the rules and regulations of the National Board of Fire Underwriters. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR KOERBER *One credit hour*

EE 11 Direct Currents. Theory and application of electrical machinery. Required of Juniors in Civil Engineering. First term.

MR. HILLEGASS *Two credit hours*

EE 20 Electrical Design. The calculation, design, and construction of direct and alternating current machinery. Required of Seniors in Electrical Engineering. Six hours a week.

PROFESSOR KOERBER *Three credit hours*

EE 30 Electrical Laboratory. Determination of characteristic curves; efficiencies and magnetic leakage of direct current dynamos and motors; life and efficiency tests of arc and incandescent lamps. Required of Juniors in Mechanical and Electircal Engineering. Three hours a week.

PROFESSOR KOERBER *One and one-half credit hours*

EE 31 Electrical Laboratory. Efficiencies and characteristic curves of alternators, synchronous motors, induction motors, and transformers. Required of Seniors in Electrical Engineering. Six hours a week.

PROFESSOR KOERBER *Three credit hours*

EE 32 Electrical Laboratory. Testing of alternating current machinery and apparatus. Required of Seniors in Mechanical Engineering. Three hours a week.

MR. HILLEGASS *One and one-half credit hours*

ENGLISH

PROFESSOR SYPHERD, ASSISTANT PROFESSOR DUTTON, AND MR. POHL

The courses in the Department of English are designed (1) to enable every student at graduation to express his ideas, orally or in writing, in accurate, clear, effective English; and (2) to give to students through required and elective work an acquaintance with the best authors in English and American Literature and an appreciation of good poetry and prose. All Freshmen are required to take Composition, which involves training in oral and written expression; all Sophomores, a general course in Literature, which treats writers, types, and movements. An additional course in English is required of Seniors in Arts and Science and in Engineering.

E 1 Composition. Oral and Written. An elementary course which lays especial stress on accuracy and clearness. Recitations, oral and written exercises, and conferences. One hour a week is devoted to practical oral work. Required of all Freshmen.

PROFESSOR SYPHERD, ASSISTANT PROFESSOR DUTTON, AND MR. POHL

Three credit hours

E 2 Literature. Introductory Course. A study of the chief works in English Literature from "Beowulf" to Tennyson, and of the types of literature which they represent. Outside readings, discussions, lectures, and conferences. Required of Sophomores in Agriculture and Engineering.

ASSISTANT PROFESSOR DUTTON AND MR. POHL *Two credit hours*

E 2a Literature. Introductory Course. An expansion of Course 2. Required of Sophomores in Arts and Science.

ASSISTANT PROFESSOR DUTTON AND MR. POHL *Three credit hours*

E 3 Literature. Nineteenth Century. The Novel. A study of the art of the novel based on a careful analysis of one representative novel and an extensive reading among the novelists of the century. Elective for Juniors and Seniors, and, with the consent of the instructor, for Sophomores. First term.

PROFESSOR SYPHERD *Three credit hours*

E 4 Literature. Nineteenth Century. Poetry. Studies in the poetry of Robert Browning, accompanied by outside reading of other poets of the Victorian Age. Elective for Juniors and Seniors, and, with the consent of the instructor, for Sophomores. Second term.

PROFESSOR SYPHERD *Three credit hours*

E 5 Literature. Chaucer and Shakspere. A critical and appreciative study of some of the Canterbury Tales and other poems of Chaucer, first term; a critical study of one of Shakspere's plays, accompanied by a rapid reading of several other plays, second term. Elective for Juniors and Seniors, and, with the consent of the instructor, for Sophomores. [Omitted in 1916-1917].

PROFESSOR SYPHERD *Three credit hours*

E 6 American Literature. The aim of this course is to make a general study of the most important works of American writers from the period of the Revolution down to the present time, and a critical study of a few of the best known works of Irving, Hawthorne, Poe, and others. A careful study of the connection between the literature and the life of the time is also made. Considerable outside reading is required and more suggested, and memory passages are assigned. Lectures, recitations, and reports. Elective for Sophomores and Juniors.

ASSISTANT PROFESSOR DUTTON *Three credit hours*

E 7 Composition. Technical English for Engineers. In this course, students have practice in the writing of business letters, reports, instructions, orders, specifications and contracts, and general engineering papers. Required of Seniors in Engineering.

PROFESSOR SYPHERD *One credit hour*

E 8 Composition. An advanced course in writing open to Sophomores and Juniors. This course is designed for students who desire further practice in narrative, expository, and argumentative writing. Special attention is given to journalistic writing. Themes, reports, and conferences.

Two credit hours

E 9 Composition and Literature. A study of the English essay, with abundant exercises in expository writing, first term; a study of the short story in English, with exercises in narrative writing, second term. Required of Seniors in Arts and Science.

PROFESSOR SYPHERD *Two credit hours*

E 10 Composition. This course is designed to give students in Agriculture training in the planning and phrasing of such papers as they will be called upon to write in connection with the practice of their profession. Elective for Juniors and Seniors in Agriculture.

ASSISTANT PROFESSOR DUTTON *One credit hour*

E 11 Literature. Modern drama. Rapid survey of English drama from Shakspere to the nineteenth century. Influence of the French school and Ibsen. Intensive study of Jones, Shaw, Pinero, etc. Outside readings, discussions, lectures, and practice in dramatic writing. Elective for Juniors and Seniors in Arts and Science.

MR. POHL *Three credit hours*

E 12 Literature. Anglo-Saxon. Elementary course. Elective for Seniors in Arts and Science. Second term.

PROFESSOR SYPHERD *Two credit hours*

E 13 Teachers' Course. The teaching of English in the schools. Open to teachers and to Seniors.

PROFESSOR SYPHERD Saturday, 9.00-11.00 *Two credit hours*

E 14 Debating. Elective for all students but Freshmen.

One credit hour

HISTORY AND ECONOMICS

PROFESSOR VAUGHN, DR. GREENFIELD, AND PROFESSOR COUNTS

The courses in this Department are arranged in the approximate order in which they should be taken by the student. In the first two years certain courses are required; all other courses are elective. Sophomores may, with permission of the Department, elect courses 4, 5, 6, or 7 in addition to the required work. Courses 13 and 14 may upon permission of the instructor be taken for two years in succession. In all work as outlined an attempt is made not only to afford general information and culture but also to give practical training in citizenship. It is believed that these courses are essential to those who are looking forward to a career in one of the professions.

H 1 European History. An introductory course dealing with the history of Western Europe during the mediaeval and modern periods, with special reference to the leading institutions, significant events, and dominant personalities of the successive epochs. Required of Freshmen in Arts and Science.

DR. GREENFIELD *Three credit hours*

H 2 History and Government of Delaware. The aim of this course is to give a general view of the history of Delaware as colony and state, and also to outline the main features of its government. Required of Freshmen in Engineering and Agriculture. First term.

PROFESSOR VAUGHN *One credit hour*

H 3 History of the United States. A somewhat advanced course in American history, embracing the colonial and Revolutionary periods, early national development, slavery and westward expansion, the civil war and reconstruction, and recent developments. A portion of the time will be given to Delaware history in relation to these movements. Required of Sophomores in Arts and Science.

PROFESSOR VAUGHN *Three credit hours*

H 4 History of England. A general study of the development of the English people—political, social, institutional, and literary—from the earliest times to the present day. Such topics as economic history, the rise of democracy, and the growth of empire, call for special emphasis. Source readings and reports. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Three credit hours*

H 5 The French Revolution. A study of modern thought and scientific progress and of modern social movements, at their inception in the eighteenth century and the revolutionary epoch. The Revolution is emphasized as a social readjustment and the age of Napoleon is viewed with especial attention to its permanent effects. Elective for Juniors and Seniors. First term.

DR. GREENFIELD *Three credit hours*

H 6 Europe since 1815. A study of political and social life,—the revolution in France, the founding of Germany and Italy, the development of the British Empire, Turkey and the Eastern Question, and modern democracy and material progress,—as a background for the understanding of existing conditions in Europe. Elective for Juniors and Seniors. Second term.

DR. GREENFIELD *Three credit hours*

H 7 Introduction to the Study of Society. This course treats of the origins of society and of our present social institutions, and aims to give the student a working knowledge of society and social phenomena. First term.

PROFESSOR COUNTS *Three credit hours*

H 8 Practical Sociology. A study of present day society with special reference to certain of the more important social problems. Such topics as the following will receive particular attention: the family, the rural community, the modern city, the conflict of classes, distribution of wealth, population, immigration, the negro, social treatment of crime, and eugenics. Second term.

PROFESSOR COUNTS *Three credit hours*

H 9 Principles of Economics. The purpose of the course is to give the student a knowledge of the fundamental principles of economic science and to furnish a basis for the study of present-day problems. Readings and reports. Elective for Juniors and Seniors. First term.

DR. GREENFIELD *Three credit hours*

H 10 Economic Problems. The following problems will be considered as thoroughly as time permits: (1) Money, credit, and banking, (2) the tariff, (3) labor problems, (4) monopolies and trusts, (5) socialism, and (6) taxation. Outside reading and reports. Elective for Juniors and Seniors. Second term.

DR. GREENFIELD *Three credit hours*

H 11 Labor Problems. (Prerequisites: H 8 and 9). A study of the special problems and interests of wage earners, such as labor unions, strikes and boycotts, poverty and unemployment, standards of living, workman's insurance, employer's liability, conciliation and arbitration, cooperative experiments, etc. Elective for Juniors and Seniors. [Omitted in 1916-1917].

DR. GREENFIELD *Three credit hours*

H 12 American Government. A general course dealing with the structure and activities of the American government, both state and national. Stress is laid upon constitutional questions and judicial decisions and upon practical problems, such as government regulation of commerce, etc. Outside reading and occasional reports. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Three credit hours*

H 13 Studies in Delaware History. An advanced course which offers opportunity to develop special topics in the social, economic, and political history of the State. The aim is partly information and partly training in research work. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Two or three credit hours*

H 14 Research Course. A special course in methods of reading and research work, designed especially for those working up theses for graduation and the various contests of the year. The student may select his topics for investigation from any of the fields of work outlined above-history, economics, sociology, government, Elective for Juniors and Seniors.

One or two credit hours

HORTICULTURE

PROFESSOR McCUE AND MR. PAILTHORP

All courses given by the Horticultural Department are elective for Agricultural students with the exception of course 14, which is required of all students in Agriculture and is elective for Arts and Science students.

A student specializing in Horticulture will be expected to take practically all of the courses offered by the Department.

The college is very fortunately located for the study of Horticulture. The fruit and vegetable growing centers of the State are easily accessible. Many famous fruit and truck growing districts in neighboring States are distant but a few hours' ride. The cold storage houses and the large markets of Philadelphia can be reached in an hour's time, and a famous greenhouse district of Pennsylvania lies only a few miles to the north of Newark. The earnest student will have many opportunities to see the practical growing, harvesting, and marketing of horticultural crops.

The Experiment Station possesses about forty acres of orchards and gardens, that can, to a limited extent, be used for purposes of instruction. All the tree, bush, and vine fruits that can be grown in the State are found in the college orchards. About an acre of land is also available for the use of students in vegetable gardening. A small greenhouse is available for instructional purposes.

Hort 1 Plant Propagation. (Prerequisite: Biol 4).

A discussion of the principles governing the propagation of plants by seeds, buds, grafts, layers, and cuttings. Elective for students in Agriculture. First term. Four hours.

MR. PAILTHORP *Three credit hours*

Hort 2 Vegetable Gardening. (Prerequisite: Hort 1) A study of the location of vegetable gardens and truck farms. Soil, cultural, and fertilizer requirements of the principal trucking crops. A study of the construction and management of hot beds and cold frames. Each student is required to plan, plant, and cultivate a small garden. Trips of inspection are required. Elective for Agricultural students. Second term. Four hours.

MR. PAILTHORP *Three credit hours*

Hort 3 Pomology. (Prerequisite: Hort 1) A general course in fruit growing designed to meet the needs of those students who do not wish a detailed technical course in orcharding. Elective for students in Agriculture. First term. Four hours.

PROFESSOR MCCUE AND MR. PAILTHORP *Three credit hours*

Hort 4 Pomology. (Prerequisite: Hort 3) Commercial Pomology. A course designed to deal with the details of fruit production, both from the practical and scientific standpoints. Special emphasis is placed upon spraying. Elective for Agricultural students. Second term. Four hours.

PROFESSOR MCCUE AND MR. PAILTHORP *Three credit hours*

Hort 5 Forestry (Prerequisite: Biol 4). A brief introductory course in Forestry. The course embraces a discussion of the handling of wood lots, care and protection of the forests, forest mensuration, and studies of the forest trees of the U. S. Elective for Seniors and Juniors in Agriculture. First term.

PROFESSOR MCCUE *Two credit hours*

Hort 6 Landscape Gardening. (Prerequisites: Biol 4; Hort. 1). This course gives a discussion of the laws of

ornamental gardening, planning and making lawns, grouping of trees and shrubbery, and the comparisons between the formal and naturalistic styles of gardening. Elective for Seniors and Juniors in Agriculture. Second term.

MR. PAILTHORP *Three credit hours*

Hort 7 Advanced Pomology. (Prerequisites: Biol 4; Hort 1, 3, and 4). A continuation of course 4. Elective for Seniors in Agriculture. First term.

PROFESSOR MCCUE *Three credit hours*

Hort 8 Breeding of Horticultural Plants. (Prerequisites: Hort 1, 2, 3, 4, and 14). A study of the application of the laws of heredity to economic horticulture. Elective for Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Three credit hours*

Hort 9 Forcing Crops. (Prerequisites: Hort 1 and 2; Biol 3, 4, and 5). A study of greenhouse crops, both vegetable and floral, and greenhouse construction. Elective for Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Three credit hours*

Hort 10 Small Fruits. (Prerequisites: Hort 1 and 3). A discussion of the commercial production of strawberries, raspberries, gooseberries, and currants. Elective for Juniors and Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Two credit hours*

Hort 11 Systematic Pomology. (Prerequisites: Hort 3 and 4). A study of the systematic relationship of the cultivated fruits of the United States. Identification, description, and judging of the common commercial varieties of apples, pears, plums, grapes, and peaches grown in America. Elective for Seniors in Agriculture. First term. [Not given in 1916-17].

PROFESSOR MCCUE AND MR. PAILTHORP *Three credit hours*

Hort 12 Horticultural Seminar. A study of the literature of horticulture, both past and present, and cur-

rent events of horticultural interest. Required of all Senior students majoring in Horticulture. First term. Two hours.

PROFESSOR MCCUE AND MR. PAILTHORP *One credit hour*

Hort 13 Horticultural Seminar. A continuation of Hort 12. Required of all Senior students majoring in Horticulture. Second term. Two hours.

PROFESSOR MCCUE AND MR. PAILTHORP *One credit hour*

Hort 14 Genetics. (Prerequisites: Biol 1 and 4) A brief course discussing the foundation principles and the various theories of heredity. Required of Seniors in Agriculture and elective for Juniors and Seniors in Arts and Science. First term.

PROFESSOR MCCUE *Three credit hours*

Students majoring in Horticulture are urged to take courses 4 and 5 in Agronomy and courses 3 and 5 in Biology.

MATHEMATICS

PROFESSOR HARTER, PROFESSOR SHORT, ASSISTANT PROFESSOR PRESTON, AND MR. MCAVOY

Four hours a week of pure Mathematics are required in all courses in the Freshman year, except in the course in Agriculture, where Mathematics is discontinued at the end of the first term.

Occasional lectures are given to show the interdependence of the various branches of Mathematics, to illustrate the laws expressed in the formulas, and to impress upon the mind of the student the beauty as well as the usefulness of Mathematics.

A student will not be permitted to enter a course in Mathematics unless those subjects marked prerequisite have been passed.

M 1 Solid Geometry. Required of Freshmen in Arts and Science, and Agriculture. First term.

MR. MCAVOY *Two credit hours*

M 2 Plane Trigonometry. Required of Freshmen in Arts and Science, and Agriculture. First term.

PROFESSOR SHORT *Two credit hours*

M 3 Spherical Trigonometry. Required of Freshmen in Arts and Science. Second term.

ASSISTANT PROFESSOR PRESTON *One credit hour*

M 4 College Algebra, including review of elements. Required of Freshmen in Arts and Science. Second term.

ASSISTANT PROFESSOR PRESTON *Three credit hours*

M 6 Analytic Geometry. (Prerequisites: M 16, M 17 or M 2, M 3, M 4). Required of Sophomores in Engineering. Elective for others. Plane: First term. Solid: First two weeks of second term.

ASSISTANT PROFESSOR PRESTON *Four credit hours*

M 7 Differential and Integral Calculus. Fundamental principles and applications. Required of Sophomores in Engineering. Elective for others.

ASSISTANT PROFESSOR PRESTON *Four credit hours*

M 8 Applications of the Calculus. (Prerequisite: M 7). Required of Juniors in the Civil, Mechanical, Electrical, and Chemical Engineering courses. Open for election to all other qualified students.

PROFESSOR HARTER *Three credit hours*

M 9 General Astronomy.

PROFESSOR HARTER *Two credit hours*

M 10 Elementary Mechanics. Required of Sophomores in the Civil, Mechanical, Electrical, and Chemical Engineering courses. First term.

PROFESSOR HARTER *Three credit hours*

M 11 Theoretical Mechanics. (Prerequisite: M 7).

PROFESSOR SHORT *Five credit hours*

M 12 Differential Equations. (Prerequisite: M 8). First term.

PROFESSOR HARTER *Two credit hours*

M 13 Theory of Functions. (Prerequisite: M 8). Second term.
PROFESSOR HARTER *Two credit hours*

M 14 Method of Least Squares. (Prerequisite: M 7). First term.
PROFESSOR HARTER *Two credit hours*

M 15 Quaternions. (Prerequisite: M 7). Second term.
PROFESSOR HARTER *Two credit hours*

M 16 Plane Trigonometry and Elements of Algebra. Required of Freshmen in Engineering. First term.
ASSISTANT PROFESSOR PRESTON *Four credit hours*

M 17 Spherical Trigonometry and College Algebra. Required of Freshmen in Engineering. Second term.
ASSISTANT PROFESSOR PRESTON *Four credit hours*

MECHANICAL ENGINEERING

PROFESSOR M. VANG. SMITH, ASSISTANT PROFESSOR SRAGER, MR. HILLEGASS, AND MR. STRING

ME 1 Elements of Steam Engineering. A general description of engines and boilers; their fundamental principles; detailed description of their parts; the reasons for using various elements of construction; practice in the use of an engineering vocabulary; freehand sketches of various parts of engines and boilers; problems. Required of all Juniors in Engineering. Second term.
MR. HILLEGASS *Three credit hour*

ME 3 Thermodynamics. The fundamental laws o the mechanical theory of heat, and their application t gases, saturated and superheated vapors; the theory o steam, air, and gas engines, and refrigeration machines Required of Seniors in Mechanical Engineering.
PROFESSOR SMITH *Two credit hour*

ME 4 Steam Engines and Boilers. The principle theory, and construction of the steam engine. The funda mental principles of steam turbines. Power plant auxi

iaries. Steam boilers; their principles, design, and construction. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR SMITH *Four credit hours*

ME 6 Gas Engines. The theory and principles of the gas engine; its construction and operation; gas producers. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR SMITH *One credit hour*

ME 9 Steam Turbines. A further consideration of their theory and construction. A continuation of ME 4. Required of Seniors in Mechanical Engineering.

PROFESSOR SMITH *One credit hour*

ME 20 Descriptive Geometry. The solution of problems relating to points, lines, planes, and surfaces, with practical applications. Recitations and drawing. Required of all Freshmen in Engineering.

ASSISTANT PROFESSOR SRAGER *Two credit hours*

ME 21 Mechanical Drawing. The care and use of instruments and materials; outlining; principles of outline shading; section lining; projections; lettering; intersection and development of surfaces. Required of all Freshmen in Engineering. Three hours a week.

ASSISTANT PROFESSOR SRAGER *One and one-half credit hours*

ME 22 Mechanical Drawing. Free hand sketching; detailed working drawings and assembly drawings; tracing; blue printing; use of handbooks. Required of all Sophomores in Engineering. Three hours a week.

ASSISTANT PROFESSOR SRAGER *One and one-half credit hours*

ME 23 Mechanical Drawing. Extension of course ME 22; drawing from empirical formulas; methods of laying out cams, gear wheels, and other mechanical contrivances. Required of Sophomores in Mechanical and Electrical Engineering. Second term. Three hours a week.

ASSISTANT PROFESSOR SRAGER *One and one-half credit hours*

ME 24 Kinematics. The laws of motion; combinations of pure mechanism; rolling and sliding contact; velocity diagrams; linkwork; cams; pulleys; forms of gear teeth. The general theory of slide valve and link motions. The application of the Zeuner diagram to the design of the principal slide-valve gears. Classroom work and drafting. Required of Juniors in Mechanical and Electrical Engineering.

ASSISTANT PROFESSOR SRAGER *Four credit hours*

ME 25 Machine Design. The principles of the design of machinery; their application to the design of special parts, comprising the calculation of all stresses and the necessary distribution of metal to withstand them; properties and uses of materials; the use of handbooks. Classroom work, lectures, and drafting. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH *Three credit hours*

ME 30 Experimental Engineering. The methods of measuring power; standardization and calibration of instruments; brake and dynamometer tests; efficiency tests of engines, boilers, steam pumps, blowers, and condensers; calorific value of fuels; tests of the common constructive materials. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH AND MR. HILLEGASS *Three credit hours*

ME 31 Experimental Engineering. A course similar to ME 30. Required of Seniors in Electrical Engineering. Three hours a week.

PROFESSOR SMITH AND MR. HILLEGASS *One and a half credit hours*

ME 40 Carpentry and Wood Turning. The care and general use of wood-working tools; exercises in carpentry; exercises in wood-turning; practical instruction in firing steam boilers and the operation of steam engines. Required of all Freshmen in Engineering. Three hours a week.

MR. STRING *One and one-half credit hours*

ME 41 Metal Work and Forging. Exercises in metal turning, facing, boring, planing, drilling, thread cutting, and milling; the use of metal-working hand tools, chipping, and filing; forging and tool dressing; the construction of machine parts, finishing, and assembling; management of steam engines and boilers. Required of Sophomores in Mechanical and Electrical Engineering. Three hours a week.

Mr. String *One and one-half credit hours*

ME 42 Pattern Making and Founding. The principles of making simple patterns, core-boxes, and patterns for machine parts; core-making; dry sand moulding and casting. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

Mr. String *One and one-half credit hours*

ME 43 Supplementary Term in Shopwork. The work done during this term is the same as that described under ME 41. The term begins the day after Commencement each year and lasts two weeks. The hours for work are from 8.45 a. m. to 4.45 p. m. Required of Sophomores in Mechanical, Electrical, and Chemical Engineering.

Mr. String *Three credit hours*

ME 44 Metal Working and Forging. A course similar to ME 41. Required of Sophomores in Chemical Engineering. First term. Three hours a week.

Mr. String *One and one-half credit hour*

MILITARY SCIENCE AND TACTICS

C. C. Herman, Jr., First Lieutenant, U. S. Infantry

The main object of the military instruction given at this college is to qualify students to be company officers of infantry, volunteers, or militia.

Graduates of this college may be given an opportunity by the War Department of taking the competitive examination for commissions as Second Lieutenants in the regular army, and their services are in demand as officers

in the organization of native troops in the Philippine Islands.

All students are required to take military instruction. Exemption is granted by the Faculty only for physical disability or under exceptional circumstances, but any student who may be excused from military duty shall be required to select such other work as shall be deemed by the Faculty equivalent to the military work omitted. The great benefit of the exercise thus taken, and the fact that it teaches habits of promptness and obedience, aside from the better fitting of young men for patriotic duty in time of need, give the subject peculiar importance and value.

Three hours per week throughout the year are given to this course.

The National Government supplies arms, ammunition, and equipments, and details an officer of the army as instructor.

Each cadet is required to supply himself with the following uniforms; Cadet gray trousers and blouse, gray cap, white gloves, white standing collar, and black shoes; khaki blouse, breeches, and cap and canvas puttee leggings, and tan shoes; overcoat, dark blue. Arrangements for these are made by the commandant and each uniform provided must be inspected and approved by him before acceptance. They are well made, neat, and durable. The overcoat, by removing the hood, which is the military feature, makes an ideal college overcoat for students when in civilian clothes. The cost of the uniforms is about Gray, $14.25, Khaki, $7.25, Overcoat, $15.

The Delaware Daughters of the American Revolution and the friends of the late Lieutenant Churchman have through the Board of Trustees, established a "Lieutenant Clarke Churchman Memorial Fund," the income from which is to be used for the encouragement of military virtues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in that department.

The Roberts medal is worn by the First Sergeant of the best drilled company and is awarded in annual competition of the companies.

FRESHMAN YEAR

Mil 1 U. S. Infantry Drill Regulations. School of the Soldier. School of the Squad. Guard Manual, Duties of Sentinel, on Post, etc.

SOPHOMORE YEAR

Mil 2 U. S. Infantry Drill Regulations. School of the Company. Guard Manual, Elements of First Aid, etc.

JUNIOR YEAR

Mil 3 U. S. Infantry Drill Regulations. School of the Battalion. Firing Regulations, etc.

SENIOR YEAR

Mil 4 Field Service Regulations. Military Law. Map Reading. Map Making. Company Books. Reports and Returns.

A thesis on a military subject.

Lectures during the year by the Commandant, etc.

The practical instruction throughout the college year for all cadets consists of Infantry Drill, School of the Soldier, School of the Squad, School of the Battalion, Position and Aiming Drill, Bayonet exercise, setting up exercises, and Butts Manual, elements of First Aid to the Injured, Signaling, and Target Practice.

The members of the cadet corps have organized a Rifle Club known as the Delaware College Rifle Club. The college furnishes the ammunition and range for gallery practice. The State of Delaware has given the college permission to use its outdoor range for field practice. Medals are given as prizes for target practice.

The officers are appointed from the Senior class; the Sergeants and the Corporals from the Senior, Junior, and

Sophomore classes. Appointment is determined by proficiency and conduct the previous year.

Upon graduation, the names of such students belonging to the class as have shown special aptitude for military service will be reported to the Adjutant General, U. S. Army, and also to the Adjutant General, State of Delaware, who publishes their names in an order.

MINERALOGY AND GEOLOGY

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

Mineralogy is taught by means of recitations and lectures, followed by laboratory work on the determination of the different species of minerals. The course is three hours for one term.

Geology is taught by means of recitations and lectures. The course is three hours for one term.

Mi 1 Mineralogy. This course treats of the physical, morphological, and chemical properties of minerals and specially of the occurrence and recovery of the useful minerals. Recitations and laboratory practice. First term.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

Mi 2 Geology. This course treats of dynamical structural, and historical geology. Recitations and lectures. Second term.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

MODERN LANGUAGES AND LITERATURES

PROFESSOR E. L. SMITH AND DR. SEHRT

French and German are among the required subjects of study, and Spanish and Italian are offered to those who wish to elect them. As may be seen in detail on pages 9 to 93, four years' work in French, four years' work in German, two years' work in Spanish, and two in Italian are offered. With the approval of the Faculty, any year of years of this work may be elected by a student in addition to the amount required in his course.

Courses 1 and 2, or 10 and 11, are required of all students in the Four Year Course in Agriculture, and in Engineering, except in Chemical Engineering, in which courses 10 and 11 are required. A student in the Course in Arts and Science is required to elect at least two full courses in this department.

The work is so conducted as to give all an opportunity to learn to read the modern languages readily; to understand them when heard; to write them correctly, and so to be able easily to learn to speak them if necessity arises; but the main object is to inspire such a love for these languages and literatures as will be a source of pleasure and intellectual growth. Special attention is given to oral recitation and dictation, in so far as the tme allotted to the department permits.

FRENCH

ML 1 French Elements. The essentials of Grammar. Fraser and Squair, French Grammar, Part 1. Easy reading of modern French prose and poetry. Kuhns, French Reading for Beginners. Augier, Le Gendre de M. Poirier.

Dr. Sehrt — *Three credit hours*

ML 2 Advanced French. Study of the seventeenth century dramatists, especially Corneille, Racine, and Molière. French prose of the seventeenth century. Scientific French.

Professor Smith — *Three credit hours*

ML 3 General Survey of French Literature. Beginning at the sixteenth century. Lectures, translations, collateral reading, and reports.

Professor Smith — *Three credit hours*

ML 4 Nineteenth Century. Philosophy, history, criticism, drama, fiction, and poetry. Chateaubriand, Mme. de Staël, Hugo, Sainte-Beuve, Thierry, Merimée, Balzac, Lamartine, Beranger, Musset, Dumas père, Dumas fils, Scribe, Michelet, Thiers, Gautier, Sand, Renan, Taine,

Augier, Sardou, Brunetière, Lemaître, Faguet, Daudet, Lamartine, Béranger, Musset, Dumas père, Dumas fils, Flaubert, Zola, Maupassant, France, Loti, Coppée, de Vigny, Rostand. Lectures, collateral reading, and reports.
PROFESSOR SMITH *Three credit hours*

SPANISH

ML 5* Elementary Spanish. Study of Spanish grammar. Hills and Ford, A Spanish Grammar. Easy reading in modern Spanish prose. Asensi, Victoria. Padre Isla, Gil Blas.
PROFESSOR SMITH *Three credit hours*

ML 6 Advanced Spanish. Cervantes, Don Quixote. Oral exercises in Spanish conversation.
PROFESSOR SMITH *Three credit hours*

ITALIAN

ML 7* Elementary Italian. Study of Italian grammar with oral exercises in elementary composition. Grandgent, Italian Grammar. Easy reading in modern Italian.
PROFESSOR SMITH *Three credit hours*

ML 8 Advanced Italian. Reading of more difficult Italian prose. Dante, La Divina Commedia.
PROFESSOR SMITH *Three credit hours*

GERMAN

ML 9 German Elements. For those who do not present German as an entrance requirement. Study of German grammar with oral exercises in elementary German composition. Joynes-Meissner, German Grammar, Bacon, Im Vaterland.
Three credit hours

ML 10 Modern Prose Readings. For those who present German as an entrance requirement. Keller, Fulda, Sudermann, Eichendorff. Prose Composition.
DR. SEHRT *Three credit hours*

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*Given in alternate years

ML 11 Scientific German. Wait, German Science Reader. von Helmholtz, Ueber Goethes naturwissenschaftliche Arbeiten. Historical Readings. von Sybel, Die Erhebung Europas. Arndt, Deutsche Patrioten.

Dr. Sehrt *Three credit hours*

ML 12 Classical Period. Goethe: Faust, Iphigenie, Gedichte. Schiller: Maria Stuart, Gedichte. History of German Literature: The Classical Period.

Dr. Sehrt *Three credit hours*

PHYSICAL TRAINING

Mr. McAvoy

It is the desire of the college to encourage some form of exercise on the part of the entire student body. It is believed that for the great majority of college men the best solution for the problem of rational and effectual physical training is to be found in well regulated athletics. Gymnastic exercises are recognized as being readily adapted to the meeting of special needs and to the correction of bodily defects.

Special provision has been made for Freshmen and Sophomores. The Department has organized a system of exercises calculated to maintain and develop the physical strength of the student and at the same time prevent any of the evils which might arise from exercises that are too violent. The exercises thus provided for are obligatory upon the two above mentioned classes, subject to exception by the Physical Director.

For those not incapacitated nothing is more conducive to bodily growth and development than properly regulated athletic contests. Intercollegiate football games are held in the fall. Basketball and indoor work such as

wrestling, boxing, and volley ball are given attention in the winter. Baseball and track work are given special attention in the spring.

By requiring every student to take a certain amount of exercises during the first part of the college course, it is thought that interest will be aroused and a habit of regularity will be established which is essential to his best health and efficiency throughout the remainder of his college course and after-life.

PT 1 Physical Training. Outdoor and indoor exercise. One hour.

One-half credit hour

PT 2 Physical Training. Athletic exercises. One hour.

One-half credit hour

PHYSICS

PROFESSOR HARTER AND PROFESSOR KOERBER

In the arrangement of the work in Physics the wants of all classes of students are carefully considered. Three periods a week throughout the Sophomore year are given to recitations and lectures in the courses of Civil, Mechanical, Electrical, and Chemical Engineering, and Agriculture. This study is open for election to students in the course of Arts and Science in any year of their course. Besides, Laboratory exercises of two hours a week are required of all who take Physics 1.

A more advanced course dealing chiefly with mechanics, heat, and electricity is open to students of the Arts and Science course after the completion of the work of Physics 1 and Physics 2.

PS 1 General Physics. Recitations, lectures, demonstrations.

PROFESSOR HARTER *Three credit hours*

Ps 2 Laboratory Work in Physics. For students in

the course of Arts and Science, and Agriculture. Two hours.

PROFESSOR HARTER *One credit hour*

Ps 3 Laboratory Work in Physics. For students in Civil, Mechanical, Electrical, and Chemical Engineering.

PROFESSOR HARTER AND PROFESSOR KOERBER *One credit hour*

Ps 4 Second year in Physics. Lectures, recitations, laboratory work. Four hours.

PROFESSOR HARTER *Three credit hours*

PSYCHOLOGY AND EDUCATION

PROFESSOR COUNTS

The aim of this department is twofold: (1) It offers, for the present, two fundamental courses in Philosophy—Psychology and Ethics; and (2) it seeks to provide a specific training for those who intend to enter the teaching profession.

Psy 1 Introductory Psychology. The aim of this course is to acquaint the student with the general field of psychology, together with its methods, its aims, and its relations with the other social and biological sciences. First term.

Three credit hours

Psy 2 Ethics. A study of the origins of moral attitudes is followed by an analysis of the moral consciousness and a constructive criticism of our present moral standards. Second term.

Three credit hours

Psy 3 Introduction to Education. This course introduces the student to the general problems of education, and to the sources of information and methods that lead to a scientific study of them. Particular attention is given to the aim of education, the mental development of the child, individual differences, the psychology of learning, transfer of training, habit-formation, and educational tests. First term.

Three credit hours

Psy 4 General Methods. Two things are done in this course. In the first place, the methods of learning involved in the various school subjects and the corresponding methods of teaching are considered. The related matters of securing interest and attention, and of making provision for individual differences are also treated. In the second place, this course deals with the organization of the public school curriculum as related to social conditions and social needs. Careful attention is given to the demands for courses that will meet the needs of vocation, health, civic and social life, and moral conduct. Second term.

Three credit hours

SOIL BACTERIOLOGY

PROFESSOR MANNS

SB 1 Soil Bacteriology. (Prerequisites: Bacteriology 1; Chemistry 5). The course consists of a study of the economic importance of the invisible but highly active soil organisms. These organisms, the bacteria, fungi, and protozoa, have been shown in recent years to play an active part in soil fertility. A study will be made of their work in relation to ammonification, nitrification, and denitrification; the influence of cropping and tillage on the flora; the economic use of fertilizers and lime; bacteria in relation to the fixation of nitrogen by legumes; sick hours of laboratory. Second term.

The laboratory work will consist in a quantative and qualitative study of the types of flora, i. e., the ammonifiers, nitrifiers, nodule organisms, and some parasitic fungi from sick soils; measuring the rate of nitrification, fixation of atmospheric nitrogen, and ammonification in different soils variously manured, fertilized and limed. For Seniors in agriculture. One hour lecture and four hours laboratory. Second term.

Three credit hours

GENERAL INFORMATION

EXPENSES

Tuition

Tuition is free to students from the State of Delaware. The tuition for all other students is $25 a year.

Fees

	First Term	*Second Term*
INCIDENTAL EXPENSES	$20.25	$20.25
Use of Library		
Use of Gymnasium		
Athletics		
Ordinary "wear and tear"		
LABORATORY		
Shop		
Freshman year	3.75	3.75
Sophomore year	5.25	5.25
Junior year	3.75	3.75
Chemistry	7.50	7.50
Zoology	1.25	1.25
Botany	1.25	1.25
Bacteriology	2.50	2.50
Electrical Engineering		
Junior year	6.00	6.00
Senior year	6.00	6.00

MATRICULATION

A fee of $5.00 is charged to each student on entering college. This fee is collected but once.

Military Uniform

	First Term	Second Term
Gray Suit	14.25	
Khaki		7.25
Overcoat	15.00	

Room and Board

Rooms may be obtained in the town from $1.25 a week up (two in a room).

Board in the Students' Association costs approximately 4.00 a week, or, for the year of 36 weeks, approximately $144. Board in the town ranges from $4.00 to $5.50 a week.

Estimated Total Expenses

The usual expenses for the year of a Freshman from the State of Delaware who boards in Newark may be estimated approximately as follows:

Matriculation	$ 5.00
Incidental expenses	40.50
Military uniforms, including overcoat	36.50
Board, 36 weeks at $4.00	144.00
Room, 36 weeks at $1.50	54.00
Books	12.00
Laundry	18.00
Other incidentals (personal expenses)	25.00
Total	$335.00

For a student in Agriculture, $2.50 should be added for charges in Botanical Laboratory. For a student in Engineering, approximately $25 should be added for draughting instruments and Shop charges. For a student coming from another state, $25 should be added for Tuition.

The actual expenses of Freshmen range from a minimum of $160 (including Commuter's ticket from Wilmington) through a mean of $300 to a maximum of $530.

Payments

The matriculation fee of $5.00 must be paid at the time of registration.

The college bill for the first term is due and payable at the opening of the college year; the bill for the second term, at the opening of the second term. In order to be admitted to classes and laboratories, students must present to the Instructors in charge the Treasurer's receipt for the payment of the fixed charges of the college.

Registration

Application for admission to college should be made to the Secretary of the Faculty before Tuesday, September 19, 1916. Candidates for admission to the Freshman class are advised to submit their applications and credentials at the time of the Entrance Examinations in June or during the summer preceding the college year in which they wish to enter. Sophomores, Juniors, and Seniors should register on or before Thursday, September 21, 1916.

Advisers

Discipline in the college is directly in charge of a board of advisers. The adviser for the Freshman Class is appointed by the President at the beginning of each academic year. The advisers for the other classes are appointed by the President at the close of each academic year from a list of men chosen by the respective classes. For the academic year 1915-1916 the advisers are: Professor Koerber, Senior; Professor E. L. Smith, Junior; Professor Short, Sophomore; and Professor Sypherd, Freshman.

Attendance

Regular attendance is required at all college exercises. Suitable rules governing absences have been adopted and any student not observing them will be dropped from the college. Punctual return to the college after vacation or at the beginning of a term is insisted upon. All

absences immediately preceding or following a vacation are counted double.

All work missed by reason of necessary absences must be made up to the satisfaction of the professor concerned; otherwise the student will be marked zero for each exercise missed. The privilege of making up work will not be granted after an unexcused absence.

Religious Instruction

The college is in no sense sectarian, but every student is expected to attend public worship at least once each Sunday at such place as parent or guardian may select. All students are required to be present at the daily morning chapel exercises.

Government

Discipline is administered by the Faculty. The government is mild but firm. Sound principles of morality are taught, and sentiments of manliness, honor, and self-respect are impressed upon the students. Misbehavior is reprimanded privately, and for gross disorder the parent or guardian is requested to remove the offender. Suspension or expulsion is the last resort.

Examinations

Examinations in all subjects are held at the close of each term and are concluded either in writing, or orally, as the nature of the subject may require or as the professor may prefer. Review examinations are also held at other times whenever, in the judgment of the professor, the objects of instruction may be promoted by such means. The examinations are designed not as a mere test of the student's knowledge, but as a valuable training in rapid, concise, and accurate expression. They serve as a valuable means of giving the student a ready command of his mental powers, and, by encouraging a review of a period of work, they give him a broader view and a firmer hold of the several subjects of study.

In determining a student's fitness to proceed to a higher class great weight is given to the character of his performance of recitation room duties. The results of the term examinations are combined with the recitation records; but in fixing the student's standing, the quality of his recitation work is the weightier factor.

No student will be promoted unless he has completed three-fourths of the work of his class of the year just passed and has no condition in previous years unsatisfacfied.

Re-examinations

Students who fail in an examination in any subject are required to pay a fee of one dollar for a re-examination and two dollars for any re-examination thereafter. In order to be admitted to a re-examination students must present to the examiner a certificate properly signed showing that the fee has been paid. The money arising from this source will be expended for books for the general library.

Reports

At the close of each term a report of the student's general combined recitation and examination record will be sent to his parents or guardian. These reports show the course of study the student is pursuing and the class in which he is enrolled. Parents are urged to give these reports close attention, and, when the reports indicate any lack of attention to duty, to co-operate with the Faculty in correcting habits of idleness and indifference.

Students' Self-Aid

During the autumn of 1914, the President appointed a committee to secure employment for students who depend on their own resources. This committee endeavors to secure such employment as will interfere least with the regular college work. All students wishing to avail themselves of opportunities thus offered are requested to reg-

ister with the chairman of the committee, Professor Harold E. Tiffany.

PRIZES AND SCHOLARSHIPS

The Bishop Coleman Memorial Prize

The Bishop Coleman Memorial Prize of twenty-five dollars is offered annually to the member of the graduating class having in all respects the best standing in the Senior year.

The Alumni Prizes

To encourage literary work among the students, the Alumni Association offers two prizes of thirty dollars and twenty dollars respectively to the best and second best debaters in an annual contest. The winner of any one of the prizes is not eligible to contest for that prize again.

Lieutenant Clarke Churchman Memorial Prize

The Delaware Daughters of the American Revolution and friends of Lieutenant Clarke Churchman have established a "Lieutenant Clarke Churchman Memorial Fund," the income from which is to be used for the encouragement of military virtues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in the military department. The prize derived from this fund amounts annually to twenty-five or thirty dollars.

The Freshman English Prize

A prize of twenty-five dollars is offered by a friend of Delaware College, to the student who attains the highest standing in English 1 (Freshman Composition) during the academic year 1915-1916.

The Philo Sherman Bennett Prize

The Hon. William Jennings Bryan, in carrying out the will of Philo Sherman Bennett, Esq., late of New Haven, Connecticut, has designated Delaware College as one of the twenty-five colleges or universities to receive its share of an endowment of ten thousand dollars to be invested and the proceeds to be applied to the payment of an annual prize "for the best essay discussing the principles of free government." Delaware College has accordingly received four hundred dollars in trust for this purpose, and from the income derived from this sum an annual prize will be awarded to the undergraduate student who presents the best essay in the fields prescribed. The income from this fund yields an annual prize of twenty to twenty-five dollars.

The W. C. T. U. Prizes

The Women's Christian Temperance Union offers annually two prizes in Oratory and Composition to be open to all undergraduate students of the College. The contestants have a wide range of subjects from which to choose, the only restriction imposed being that they shall be from the entire field of Scientific Temperance. The first prize for 1916 is thirty-five dollars and the second prize is fifteen dollars.

The William D. Clark Prize for Mathematics

The late Miss Julia Newton Clark, in memory of her father, William D. Clark, offered a prize of twenty-five dollars to be awarded at the end of the Sophomore year to the student who had shown the greatest proficiency in Mathematics during his Freshman and Sophomore years. Since her death this prize has been given by Miss Emma Clark.

Trustee Prize

A prize of fifty dollars is offered by a Trustee to the Junior who, during the first three years of his course, has

maintained the highest general average of proficiency in all college activities, such as The Review, Literary Society, Y. M. C. A., the Agricultural Club, Athletics, Orchestra, and Courses of Study.

Only those students who have spent three years in residence at Delaware College will be considered.

The State Grange Prize

For the purpose of encouraging a high standard of work in the Agricultural courses, the Delaware State Grange has offered three cash prizes of fifteen dollars, ten dollars, and five dollars in gold to be awarded respectively to the three students pursuing either the four years' or the two years' course in Agriculture who have manifested the greatest interest, and made the greatest progress in their work during the year for which the prizes are awarded.

The Francis A. Cooch Botanical Prizes

To promote interest in botanical studies, Mr. F. A. Cooch, '93, has offered two cash prizes of fifteen and ten dollars respectively to students in B4 making the best and second best collection of flowering plants, ferns, and their allies native to the State of Delaware.

The William H. Purnell Prize in Modern Languages

Two prizes of twelve and one-half dollars each have been offered in memory of William H. Purnell, a former president of Delaware College, to be awarded at the end of the Sophomore year—one to the student who has shown the greatest proficiency in French and one to the student who has shown the greatest proficiency in German during the Freshman and Sophomore years.

The Edward F. Mullen Prize in Civil Engineering

A prize of twenty-five dollars is offered by Mr. Edward F. Mullen, '95, to the student in the Senior year of

the Civil Engineering course who displays most originality in preparing and writing his thesis for graduation.

The Colonel Robert G. Rutherford, U. S. A. Prize

To encourage regular attendance at drill and special proficiency in the military department, Mrs. R. A. Whittingham offers an annual prize of $10 to the student who is recommended by the Commandant.

Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware

A scholarship amounting to $100 annually was founded in 1914 by the Harvard, Princeton, and Yale Clubs of Delaware. It will be awarded to a deserving Delaware boy. The appointment is made for one year only, but the incumbent for any one year may be reappointed.

The Robert Bayne Wheeler Scholarship

Mrs. Robert Bayne Wheeler has given to the college $2500, the income from which, amounting to about $125, is to be given annually to a deserving Delaware boy to whom this amount will be of service in helping him to obtain an education.

THE TATUM MEMORIAL LECTURE FUND

Mr. Ashton R. Tatum, a friend of the College, at his death left a fund of $1000, the income from which is to be devoted to lectures on the treatment and care of horses.

LIBRARIES

The combined libraries of the college contain about 21,500 volumes.

Each department of instruction has its own library of reference works in its classroom or laboratory, under the immediate supervision of the professor in charge, from whom students may obtain books for use in connection with their work.

The general library, in which are most of the books on literature, history, economics, philosophy, etc., is, together with the reading-room, open to students from 8.15 a. m. to 10 p. m.

The library has been designated as one of the depositories for the public documents of the United States Government and from this source receives many valuable publications.

Several friends of the college have made valuable additions to the library by the presentation of books, magazines, and pictures, and further gifts are earnestly desired.

Through the courtesy of the publishers many of our State papers are regularly found on the tables of the Reading Room.

ATHLETICS

General Regulations

Football, baseball, basketball, track athletics, and tennis are recognized as collegiate sports.

The general supervision of all athletic sports is vested in an athletic council composed of two members of the Faculty, two members of the Alumni Association, and three undergraduates, chosen from the three upper classes.

All eligibility rules originate with the Faculty.

Any student who is admitted to college later than the second Monday of a term is not eligible during that term to represent the college in outside athletic contests.

No student is permitted to represent the college on any athletic team or as manager of such, who is not in good standing in his class and doing, at the time, satisfactory work in his studies.

No student pursuing a course other than one leading to a degree will be permitted to represent the college in

any athletic contest during his first year in residence, unless he shall have satisfied the entrance requirements of a course leading to a degree.

Buildings and Grounds

A spacious gymnasium containing apparatus for gymnastic exercises, a running track, shower baths, and a swimming pool, affords ample accommodations for indoor athletic sports, such as basketball, indoor-running, swimming contests, wrestling, and boxing.

In Frazer Field, the college possesses one of the best athletic fields in the country. This field, completely equipped, was donated to the college by Mr. and Mrs. Eben B. Frazer of Newark, and Mr. Stanley Frazer, '04, of New York City, as a memorial to a son and brother, Joseph Heckart Frazer, '03. The field contains a baseball diamond, football gridiron, tennis courts, and a quarter-mile cinder track with a 220-yard straightaway. It is enclosed with a hollow tile stucco wall and has a beautiful terrace along one side.

State Chemist. The Professor of Chemistry in the college is by legislative enactment ex officio State Chemist of Delaware.

State Bacteriological and Pathological Laboratory. By Act of the Delaware Legislature, a State Bacteriological and Pathological Laboratory has been established at the college. The Laboratory is under the management of the State Board of Health. Its location makes accesible the resources of the college in the way of libraries and apparatus.

ORGANIZATIONS

The Agricultural Club. The Agricultural Club is composed of the agricultural students and some members of the Faculty. It is under the management of the stu-

dents, who elect their officers each term. Meetings are held weekly and subjects relating to both class work and actual farm practice are discussed. Lecturers of repute address the Club on agricultural subjects. The object of the Club is to create enthusiasm and to promote the interests of agriculture among the students as well as to accustom the members to talk on agricultural subjects before an audience.

Athletic Association. The Athletic Association is a student organization which takes charge of details of athletic affairs not controlled directly by the Athletic Council.

Athletic Council. The Athletic Council is in direct charge of all athletic activities not constituting a part of the college curriculum. It is composed of two representatives from the Faculty, two representatives from the Alumni, and three representatives from the Students, representing respectively the Senior, Junior, and Sophomore classes.

Fraternities. Three national Greek letter fraternities have local chapters at the college: Kappa Alpha (Southern), Sigma Nu, and Sigma Phi Epsilon. A fourth organization, Omega Alpha, is local. Three of these fraternities own their houses. The average resident membership is about sixteen.

Literary Societies. Two literary societies, each nearly as old as the College, have been not only important adjuncts to the social life of the institution, but also valuable aids in its educational work. The Athenaean and Delta Phi Societies occupy a place midway between the literary societies of some larger colleges and the Greek letter fraternities now widely extended throughout the college system of the United States. Each society has a comfortable hall in the old College Building, and each has a small but well chosen library of general literature, history, biography, and popular science.

The Athenaean Literary Society was founded December 18, 1834, about six months after the opening of the College. The Society's first constitution was adopted in February, 1835, and the Society was incorporated by Act of the Delaware Legislature, February 11, 1881.

The Delta Phi Literary Society, which claims for itself somewhat greater age than its rival, was legally incorporated January 12, 1835. The Society obtained a new charter from the Legislature of Delaware about 1871, and another one in 1895.

Orchestra. The Orchestra, which was organized in 1913, plays at chapel exercises and gives concerts in Newark and other towns throughout the State.

Phi Kappa Phi. A Chapter of the Phi Kappa Phi, an honorary fraternity devoted to the interests of Scholarship, was established at the college in 1905.

Young Men's Christian Association. The college Y. M. C. A. is under the management of the students, who annually elect their officers and various committees. The room known as the Y. M. C. A. room is located in the West Wing of the improved college building. It is comfortably and tastefully furnished and always open for the use of all students. The object of the association is to promote Christian fellowship among the students and to furnish to all an opportunity for practical Christian work. Bible classes meet once a week for systematic study of the Bible. These classes are taught by teachers chosen from the association.

PUBLICATIONS

The regular publications of the college consist of the Delaware College Review, the Delaware Farmer, the Bulletin, and the Experiment Station Bulletin. The Review and the Delaware Farmer are student publications.

The Review. The Review is a weekly publication de-

voted to the general interests of the students. The subscription price is one dollar a year.

The Delaware Farmer. The Delaware Farmer is published monthly during the college year by the Agricultural Club of Delaware College. The purpose of The Delaware Farmer is two fold: (1) to publish unbiased scientific facts applicable to farm practices on the Delmarvia Peninsula; (2) to aid in placing the work of Delaware College before as many people as possible. The subscription price is fifty cents per year.

The **Bulletin** is issued quarterly. One of the four numbers is the Catalogue number. The **Experiment Station Bulletin** is issued quarterly by the Experiment Station. One of the numbers is the Annual Report. These bulletins will be sent to any address.

Students' Loan Fund. A Loan Fun to help needy students was established by the Alumni Association in 1915. The object of the Committee, which was appointed by the President of the Association, is to raise a substantial sum of money which will be placed in trust and the income of which will be used to help deserving students. Definite amounts will be loaned to students on promissory notes which the student is expected to meet as soon as he is financially able.

EXTENSION STAFF AND LECTURES

INTRODUCTION

The extension work of the college is primarily educational and does not pretend to establish a mere entertainment bureau. While the work maintains the ideals and standards of the college, it is believed that the lectures offered by the faculty will appeal to all classes and that they will fill the need for sound but interesting discussions of problems along the various lines of work represented. Some of these lectures are illustrated with lantern slides. From the list of topics outlined below, it is easy for schools, churches, granges, or clubs, to arrange for a single lecture or for a series of lectures running through the winter months. Last year one hundred and twenty-five lectures were called for.

It should be remembered, however, that no person is engaged solely for extension work, and that whatever the faculty does in this way is done because of a desire to forward the interests of the college and of the State. As the first duty is to the regular classes at the college, each member of the faculty can deliver only a limited number of extension lectures each month. But the college will do all in its power to meet the wishes of the various communities, and requests for lectures will be honored in the order in which they are received.

All inquiries concerning the extension lectures or other phases of college extension work should be addressed to Professor E. V. Vaughn, Chairman of College Extension, Delaware College, Newark, Delaware.

PROFESSOR ELISHA CONOVER

Latin and Greek

1 The Value of Classical Studies

2 The Private Life of the Romans

ASSISTANT PROFESSOR G. E. DUTTON

English

1 Walt Whitman the Poet
2 Sidney Lanier
3 Thomas Bailey Aldrich
4 The Spirit of American Literature
5 The Poetry of the American Revolution
6 The Poetry of the Civil War
7 American Lyric Poetry
8 Humor in American Poetry
9 Cowboy Songs and Ballads

PROFESSOR A. E. GRANTHAM

Agronomy

1 Some Tendencies of Rural Life
2 The Farm in Literature
3 The Origin of Our Cultivated Plants
4 Efficiency in Farm Management
5 The Story of Wheat (Illustrated)
6 Recent Advances in Agricultural Sciences
7 The Country Gentleman

PROFESSOR G. A. HARTER

Mathematics and Physics

1 The Solar System
2 The Wonders of the Heavens
3 The Physics of the Household
4 The Physics of the Weather
5 Physics of our Daily Life

PROFESSOR HARRY HAYWARD

Animal Husbandry

1 Some Problems of the Open Country
2 Taking Stock
3 Our Careers
4 Epoch Makers in Agriculture
5 The Church and Agriculture
6 Some Famous Farm Animals

PROFESSOR THOMAS F. MANNS

Plant Pathology and Soil Bacteriology

1 Our Policy in the Philippines
2 The Relation of Life in the Soil to Agriculture
3 The Seed Potato—Its Vitality and Diseases
4 Plant Diseases and Their Control

MR. W. J. McAVOY

Physical Director

1 The Value of Play
2 True Sportsmanship

PROFESSOR C. A. McCUE

Horticulture

1 "The Dooryard"
2 Life Through Death
3 Across The Painted Desert

MR. M. O. PENCE

Agricultural Agent for Kent County

1 Vocational Education
2 Training Our Farm Boys and Girls

MR. F. J. POHL

English

1 English and Scottish Popular Ballads
2 Wordsworth, Poet of the Memory
3 George Bernard Shaw, Prince of Shockers
4 Immortality as viewed by the Poets
5 Greek Drama
6 Shakspere's "King Lear"
7 Modern Drama
8 Literature and Democracy

DR. E. H. SEHRT

German

1 Germany. Its Rise and Development
3 German Cities and Villages
2 A Trip Down the Nile

PROFESSOR E. L. SMITH

French and German

1 Napoleon Bonaparte
2 Paris
3 Great German Cities

PROFESSOR W. O. SYPHERD

English

1 Literature and Life
2 What Should a High School Student Read?
3 Dickens and the Modern Reader
4 The Battle of the Books
5 Othello as a Representative Shaksperean Tragedy
5 Kipling as a Short-Story Writer
7 Joseph Conrad, a Writer of the Sea
8 Robert Louis Stevenson

PROFESSOR FIRMAN THOMPSON

Agricultural Chemistry

1 Chemistry and Civilization
2 Under the Southern Cross
3 The Hawaiian Islands

PROFESSOR E. V. VAUGHN

History and Economics

1 Some Curious Facts in Delaware History
2 Social Life in Colonial Delaware
3 The Schoolhouse as a Community Center
4 Our Town—A Typical Community
5 Mrs. Brown and Her Market Basket
6 Literature and Liberal Culture
7 An Hour with Tennyson

ASSISTANT PROFESSOR A. C. WHITTIER

Agricultural Chemistry

1 How We Live—Nutrition
2 The Chemistry of Everyday Life

THE WOMEN'S COLLEGE OF DELAWARE

PROFESSOR MYRTLE V. CAUDELL

Home Economics

1 Women as Spenders
2 Meat and Meat Substitutes
3 Beneficial Beverages
4 Bread and Bread Making
5 The Art of Home Making

PROFESSOR MARY E. RICH

Education

1 The Organization of Parent-Teacher Associations

ROSTER OF DELAWARE COLLEGE CADET CORPS

1915-1916

COMMANDANT OF CADETS

C. C. Herman, Jr.
1st Lieut., U. S. Infantry

ASSISTANT TO COMMANDANT

John Frazer
1st Sergt., U. S. A. (Retired)

Major

G. O. Smith

1st Lieut. and Batt. Adjutant
H. M. Foster

Batt. Sergeant Major
J. W. Jones

Color Sergeants

W. H. Hoch
H. Samonisky

Signal Detachment

Sergeant, L. Blumberg

PRIVATES

H. B. Cleaver
E. E. Hoey
R. C. Hill
F. C. McCaghey
W. T. Wessels
R. M. Cameron
M. E. Swing

ROSTER

	Officers	Enlisted
Field and Staff	2	3
Signal Detachment		8
Band	5	22
A Co.	4	56
B Co.	4	57
C Co.	4	56
Total	19	202
Aggregate	221	

BAND

Chief Musician

W. L. Haley, 1*st Lieutenant*

2ND LIEUTENANTS

H. V. Taylor
F. H. Buck
H. H. Ewing
W. C. Wills

Drum Major

E. W. Martin

SERGEANTS

C. B. Walls
G. C. Brower
D. A. Price
J. C. Hastings

CORPORALS

W. V. Marshall
J. M. Heinel
R. L. Sumwalt
H. W. Ewing
E. P. Catts
A. L. Lauritsen

PRIVATES

E. M. Marks
P. S. Swayne
J. L. Litz
A. Gutowitz
E. E. Ewing
W. McKinney
D. C. Todd
T. M. Whiteman
J. P. Maxwell
J. W. Humphrey
F. Groff

CAPTAINS

A	B	C
H. C. Bounds	J. W. Ramsay	C. D. Pepper

FIRST LIEUTENANTS

W. C. Newton	R. W. Weimer	L. W. Seward

SECOND LIEUTENANTS

A. G. Heinel	O. F. Gentieu	L. G. Mulholland
J. H. Salevan	J. A. Crothers	G. P. Doherty

FIRST SERGEANTS

T. R. Wilson, Jr.	R. H. Pepper	S. D. Loomis

QUARTERMASTER SERGEANTS

J. W. O'Daniel	J. A. Hopkins	H. W. Horsey

SERGEANTS

A	B	C
E. G. Smyth	L. B. Steele	M. J. Fidance
R. M. Appleby	J. H. Beauchamp	J. M. Price
V. H. Handy	J. T. Campbell	H. W. Bramhall
	A. Ruth	J. E. Brayshaw

CORPORALS

W. T. Mitchell	J. H. Alderson	H. B. Alexander
L. R. Witsil	L. B. Staten	H. Bratton
G. B. Brown	T. S. Carswell	M. Mitchell
C. R. Smith	P. D. Lovett	R. B. Wheeler
R. D. Herdman	D. P. Horsey	J. F. Davis
J. P. Gum	F. I. Reynolds	N. Taylor

PRIVATES

Barnard	Alexander, J.	Arbuckle
Berkman	Aker	Booth
Broadwater	Bowen	Braderman
Blickle	Brinton	Boggs
Craig	Cannon, E.	Brown

A

Cranston
Crothers, J. L.
Edgar
Ferguson
Fitzpatrick
Giles
Hearne, V.
Hudson, E.
Jeffries
Jones, J. H.
Kister
Lindsay
Little
McKay
Mather
Marconnetti
Middleton
Moore
Newman
O'Brien
O'Daniel
O'Rourke
O'Toole
Plam, M. W.
Plumley
Price, W.
Raughley
Robinson
Stewart
Suer
Taggart
Thomson
Thomas
DeValinger
Walton
Weldin
Wallace
Windsor
Wilson, E.
Wilson, M.

B

Clouser
Craig
Crockett
Crothers
Downing
Dickey
Folsom
Gilman
Graham
Hearne
Hoffecker, E.
Hoffecker, H.
Holland
Longland
Kalmy
Lowe
Meredith ..
McIntire
McElwee
Meyers
Marshall
Mitchell
Morrison
Peneuel
Pierson, W. M.
Proctor
Plam, L.
Reid
Shaw
Smith
Sturgis
Smart
Savin
Tunnell
Tyson
Veasey
Ward
Ward
Weigle
Wright
Wood

C

Barkley
Cannon
Cantwell
Cole
Cook
Downs
Evans
Fisher
Fowler
Goldey
Hall
Hamilton
Hudson, G.
Hutton
Kelly
Lancaster
Lang
Levy
Loraine
Mackie
Malone
Martinis
Marston
Messick
McMillen
McMullen
Marshall
O'Neil
Pierson, R. B.
Schilling
Smith, C.
Siler
Warner
Webb
Wilson
Wright
Wise
Truss
Stevens

ALUMNI ORGANIZATIONS AND ACTIVITIES

The Alumni Association of Delaware College is the central organization for the general body of Alumni. Membership is limited to graduates, to men who have completed the two years' course in Agriculture, and to other former students who may be elected by the Association.

The Annual Business Meeting is held on Commencement Day. On Tuesday and Wednesday of Commencement Week, various reunions and celebrations are held. A mid-winter dinner is held every year in February.

An Endowment Fund of $100,000, from the income of which the salary of the President of the College is paid, was started in 1913. It has already reached the sum of $67,000.

Two prizes in debating are offered annually by the Association to undergraduates who take part in a contest between the two literary societies. Medals for the winners of events in the Inter-Class Track and Field Meet are given by individuals among the Alumni.

The official organ of the Alumni Association is the Alumni News, a quarterly. The subscription price, which includes membership in the organization, is $2.00 per year. The Editorial Staff for 1915-1916 is composed of Egmont Horn, '10, Editor; and Charles W. Bush, '03, and Robert B. Wolf, '96, Assistant Editors.

The officers of the General Alumni Association for 1915-1916 are: President, Thomas Davis, Esq., '75; Vice-President, T. Bayard Heisel, '88; Secretary, Egmont Horn, '10; and Treasurer, G. E. Dutton, '04.

Graduates in various parts of the country have begun to organize branch alumni associations. Alumni in and about Pittsburgh have formed a live association under the title, "Delaware College Alumni, Western Pennsylvania Section." The officers for 1915-1916 are: W. L. Fader, Chairman; T. B. McKeon, Vice Chairman; R. B. Harvey, Secretary; and S. M. Shallcross, Treasurer.

DEGREES CONFERRED AT THE ANNUAL COMMENCEMENT

JUNE 9, 1915

Master of Science in Agriculture

Emerson, Paul (B. S. 1914) Cheswold, Delaware

Civil Engineer

Jacobs, Ralph Lynam (B. S. 1912)
Wilmington, Delaware

Houston, Liston Alexander (B. S. 1911)
Philadelphia, Pennsylvania

Electrical Engineer

Ferguson, Howard Franklin (B. S. 1904)
Pittsburgh, Pennsylvania

Bachelor of Arts, (Arts and Science Course)

Alderson, William Hulburd Wilmington, Delaware
Brown, Horace Leland Lewes, Delaware
Carey, Alfred Bradley Georgetown, Delaware
Dorsey, Leighton Coleman Spence
Wilmington, Delaware
Geoghegan, Presley Downs Rockland, Delaware
Lacklen, Edward Billings, Montana
Paynter, Russell Nassau, Delaware
Rhodes, Yorke Edward Edge Moor, Delaware
Torbert, William Leonard, Jr.
Laurel, Delaware

Bachelor of Science, (Arts and Science Course)

Armstrong, Philip Everhardt
Philadelphia, Pennsylvania
Beacom, Hamilton Bartlett Wilmington, Delaware
Bennett, Harry Thomas Wilmington, Delaware

Cann, William Ferris	Kirkwood, Delaware
Little, Herman Joseph	Wilmington, Delaware
Stiver, Ellwood Hamilton	Nazareth, Pennsylvania

Bachelor of Science in Agriculture

Brockson, Washington Irving	Middletown, Delaware
Gibney, Louis Garland	Wilmington, Delaware
Grieves, Harry Mahood	Smyrna, Delaware
Mearns, Andrew Kirkpatrick	Wilmington, Delaware
Russell, Lynford Outten	Lewes, Delaware
Schaffle, Albert	Philadelphia, Pennsylvania

Bachelor of Science in Civil Engineering

Alderson, George France	Wilmington, Delaware
McCarthy, Francis Patrick	Wilmington, Delaware
Moore, James Howard, Jr.	Cherry Hill, Maryland
Owens, Linden Gray	Bridgeville, Delaware
Weaver, Joseph	Wilmington, Delaware
Woodman, Eugene Ross	Wilmington, Delaware

Bachelor of Science in Mechanical Engineering

Manning, William Thomas	Lewes, Delaware
Wise, Allen Sherwood	Wilmington, Delaware

Bachelor of Science in Electrical Engineering

Adams, Howard Horsey	Laurel, Delaware
Heyd, John Leslie	Felton, Delaware
Hillegass, Herbert Hannibal	Newark, Delaware
Jones, Allan Marshall	Milford, Delaware
Lindsay, Herbert Vivian	Wilmington, Delaware
Montgomery, Harry Thomas	Rising Sun, Maryland
Souder, Earle Curriden	Wilmington, Delaware
Suddard, Oliver	Newark, Delaware

Bachelor of Science in Chemical Engineering

Manning, Eugene Reynolds	Wilmington, Delaware

PRIZES, SCHOLARSHIPS, AND HONORS ANNOUNCED AT THE COMMENCEMENT OF 1915

The Bishop Coleman Memorial Prize: Russell Paynter.

The Alumni Prizes: First, Morris Randolph Mitchell; second, Harvey Chaplain Bounds.

The William D. Clark Prize: Leroy Bayard Steele.

The Trustee Prize: John Wesley Jones.

The W. C. T. U. Prizes: First, Russell Paynter; second, William Homer Savin; third, Leighton Coleman Spence Dorsey; fourth, Leroy Bayard Steele.

The State Grange Prizes: First, Frazier Groff; second, Jonathan Farr Davis; third, Howard Allan Broadwater.

The Lieutenant Clarke Churchman Memorial Prize: William Ferris Cann.

The Roberts' Medal for the Best Drilled Company: Company B

The Francis A. Cooch Prizes: First, Morris Randolph Mitchell; second, William Homer Savin

The Philo Sherman Bennett Prize: Horace Leland Brown

The Clifford Stelle, Jr., Prize: Lawrence Raymond Witsil

The Henry Ridgely Prizes: First, Alfred Bradley Carey; second, Horace Leland Brown

Dr. William H. Purnell Memorial Prize: Russell Paynter

The following members of the Class of 1915 were elected to the Honorary Fraternity of Phi Kappa Phi:

John Leslie Heyd	George France Alderson
Herman Joseph Little	Harry Thomas Bennett
William Thomas Manning	Washington Irving Brockson
Russel Paynter	Horace Leland Brown

The Scholarship of the Harvard, Princeton, and Yale clubs of Delaware for 1915-1916 was awarded to Robert Sumwalt, class of 1918.

The Robert Bayne Wheeler Scholarship for 1915-1916 was awarded to Joseph P. Maxwell, class of 1919.

STUDENTS IN ATTENDANCE DURING THE COLLEGIATE YEAR 1915-1916

Abbreviations: A. & S., Arts and Science; A., Agriculture; C. E., Civil Engineering; M. E., Mechanical Engineering; E. E., Electrical Engineering; Ch. E., Chemical Engineering; E., Engineering not specified.

SENIOR CLASS

Blumberg, Leo	E. E.	Wilmington
Bounds, Harvey Chaplain	A. & S.	Dagsboro
Bramhall, Howard Wellington	A. & S.	Georgetown
Brayshaw, James Ellis	A. & S.	Delmar
Buck, Frank Haley	Ch. E.	Wilmington
Clouser, Edward Harvey	M. E.	Marshallton
Crothers, James Alexander	C. E.	North East, Md.
deValinger, Wesley	C. E.	Middletown
Doherty, Gerald Paul, Jr.	C. E.	Wilmington
Ewing, Homer Hazel	M. E.	Wilmington
Foster, Harold Morrison	C. E.	Wilmington
Gentieu, Oscar Franklin Edwin	C. E.	Wilmington
Graham, Augustus Howell	C. E.	Charlestown, Md.
Groff, Frazier	A.	Clayton
Haley, Walter Leslie	Ch. E.	Wilmington
Jones, John Wesley	A. & S.	Woodside
Martin, Edward William	A. & S.	Wilmington
Mather, John Avery	M. E.	Oswego, Kansas
Morrison, Benjamin Frank, Jr.	C. E.	Wilmington
Mulholland, Lionel George	A.	Riverside, N. J.
Newton, Warren Childs	A.	Bridgeville
Pepper, Carlton David	A. & S.	Georgetown
Price, Donald Adams	M. E.	Wilmington
Price, John Michael	E. E.	Wilmington
Salevan, James Henry	A.	Milford
Samonisky, Harris	A. & S.	Delaware City
Smith, George Oscar	A.	Narberth, Pa.
Taylor, Harry Vandom	M. E.	Dover
Walls, Carlton Beck	A. & S.	Smyrna
Weimer, Robert	A.	New York, N. Y.
Wills, William Compton	C. E.	Wilmington

JUNIOR CLASS

Appleby, Richard Morrison	A.	New Castle
Beauchamp, John Hurst	C. E.	Wilmington
Brower, George Clarence	M. E.	Federalsburg, Md.
Cameron, Raymond Mearns	A. & S.	North East, Md.
Campbell, Franklin Tracy	A.	Washington, D. C
Edgar, John	A.	Wilmington
Ewing, Harvey Wilson	A.	Zion, Md.
Fidance, Michael Joseph	C. E.	Wilmington
Fisher, Carl Rudolph	A.	Philadelphia, Pa.
Gilman, Francis Albert	A.	Philadelphia, Pa.
Handy, Victor Hugo	C. E.	Milford
Hastings, James Carlton	A. & S.	Laurel
Heinel, Arthur Garrett	A. & S.	Newark
Heinel, James McConnell	A.	Newark
Hoch, Walter Keller	E. E.	Woodside
Hopkins, John Abel, Jr.	A.	Newark
Horsey, Harold Wolfe	A. & S.	Dover
Jones, Joseph Holton, Jr.	C. E.	Wilmington
Loomis, Stanley Drake	E. E.	Meshoppen, Pa.
McCaghey, Frederick Colin	A. & S.	Baltimore, Md.
Marshall, William Virden	A.	Lewes
O'Daniel, John Wilson	A.	Newark
Pepper, Robert Houston	A. & S.	Philadelphia, Pa.
Ramsey, John Wilbert	M. E.	Newark
Ruth, Albert	C. E.	Wilmington
Smart, Lawrence Landon	M. E.	Baltimore, Md.
Smith, Chester	M. E.	Henry Clay
Smyth, Edwin Gaylord	C. E.	Wilmington
Steele, LeRoy Bayard	C. E.	Elsmere
Veasey, Harold Mercer	Ch. E.	Wilmington
Wilson, Thomas Rickards, Jr.	A. & S.	Ellendale

SOPHOMORE CLASS

Alderson, John Hartzell	A. & S.	Wilmington
Alexander, Harry Bratton	A. & S.	Elkton, Md.
Alexander, John William	E. E.	Elkton, Md.
Berkman, Alec	E. E.	Middletown
Bowen, Knowles Ritchie	C. E.	Newark
Braderman, Manuel Wilbur	A.	Wilmington
Bratton, Howard, Jr.	A. & S.	Elkton, Md.
Brown, Gassaway Bond	A. & S.	Newark
Cannon, Samuel	A. & S.	Wilmington
Cannon, William Dail	E. E.	Bridgeville
Carswell, Thomas Smyth	Ch. E.	Wilmington
Catts, Elmer Paul	E. E.	Clayton
Cleaver, Henry Paul	C. E.	Marshallton

Cooke, Raymond Ward	A. & S.	Wilmington
Crockett, David Leonard	A.	New York, N. Y.
Davis, Jonathan Farr	A.	Meshoppen, Pa.
Downing, Hugh Wagner	C. E.	Dover
Goldey, Robert Perkins	A.	Wilmington
Gum, John Poole	A. & S.	Selbyville
Herdman, Rowland Delaware	A. & S.	Newark
Hill, Robert Clarke, Jr.	E. E.	Redden
Hoey, William Bigelow	E. E.	Frederica
Hoffecker, Elwood	A.	Newark
Hoffecker, Harvey Simpson	A. & S.	Newark
Holland, Clyde Simpson	A.	Smyrna
Horsey, Donald Pancoast	A. & S.	Dover
Hudson, Earle Frank	E. E.	Georgetown
Hudson, George Allen	A. & S.	Lewes
Hutton, William Greenhalgh	A. & S.	Wilmington
Lauritsen, Allen Louis	C. E.	Lewes
Little, James Herman	E. E.	Newark
Lovett, Paul DeWitt	A. & S.	Newark
Marks, Ernest Melson	Ch. E.	Wilmington
Meyers, Charles Fulmer	A. & S.	Middletown
Mitchell, Morris Randolph	A. & S.	Newark
Mitchell, William Terry	M. E.	Newark
O'Daniel, James Allison	A.	Newark
Price, William, Jr.	A.	Middletown
Reynolds, Irving	A. & S.	New York, N. Y.
Ritz, Robert Louis	A. & S.	Newark
Savin, William Homer	A.	Cheswold
Saylor, Frank	A. & S.	Wilmington
Schilling, Karl Browne	A. & S.	Wilmington
Smith, Chester Richland	A.	Narberth, Pa.
Stayton, Leon Busick	A. & S.	Wilmington
Sumwalt, Robert Llewellyn	C. E.	Lewes
Swayne, Paul Gilbert	A.	Wilmington
Swing, David Thompson	M. E.	Ridgely, Md.
Taylor, Nathaniel Watkins	A.	Dover
Todd, DeWitt Clinton Davis	C. E.	Wilmington
Walton, Albert Slack	E. E.	Newark
Weigle, Charles Leland	A. & S.	Newark
Wheeler, Robert Bayne, 2d	A. & S.	Wilmington
Wilson, Earnest Staton	C. E.	Wilmington
Wilson, Marvel	A.	Ellendale
Witsil, Lawrence Raymond	E. E.	Wilmington

FRESHMAN CLASS

Aker, Raymond Buehm	C. E.	Delaware City
Arbuckle, Paul Taylor, Jr.	E. E.	Cherry Hill, Md.

Barkley, Robert James	E. E.	Clayton
Barnard, Daniel Paddock, 4th	Ch. E.	Wilmington
Boggs, Irving Hook	M. E.	Dover
Brinton, George Franklyn	E. E.	Wilmington
Brown, David Harvey	A. & S.	Wilmington
Cannon, Edward	A. & S.	Wilmington
Cantwell, Garrett Reed	Ch. E.	Elsmere
Cole, John Clement	E. E.	Delmar
Craig, John Gilbert	Ch. E.	Wilmington
Crothers, John Lawson	A.	North East, Md.
Crothers, Thomas Dunlap	M. E.	Zion, Md.
Dickey, Richard Earle	A.	Stanton
Downes, Hall	A. & S.	Dover
Evans, Nathaniel Hickman	A. & S.	Lewes
Ewing, Earle Elisha	E. E.	Wilmington
Ferguson, George Harvey	A. & S.	Newark
Fitzpatrick, William Stephen	A. & S.	New York, N. Y.
Giles, Samuel Hooper	E. E.	Elkton, Md.
Gutowitz, Abraham	A. & S.	Lewes
Hall, John Henry Hoffecker	A. & S.	Smyrna
Hamilton, Stewart Alexander	E. E.	Frederica
Hearne, George Wilson	A. & S.	Georgetown
Humphrey, James Willard	Ch. E.	Claymont
Jefferis, Joseph Irwin	A.	Stanton
Lancaster, Harry V. Collins	E. E.	New Castle
Lang, George Millard	E.	Wilmington
Levey, William Scott	Ch. E.	Christiana
Lindsay, Harvey Rose	A.	Providence, Md.
Longland, George Madara	A.	Mount Pleasant
Loraine, Toward Nevison, Jr.	M. E.	Chesapeake City, Md.
Lowe, Andrew George	A.	Fountain City, Tenn
Mackie, John Alfred	A. & S.	Kemblesville, Pa.
Malone, John Lea, Jr.	A. & S.	Wilmington
Marshall, Robert Twilley	M. E.	Chincoteague, Va.
Marshall, William Carter	A.	Lewes
Marston, Henry White	A.	Wilmington
Martinis, Fred Boorman	A.	Wilmington
Maxwell, Joseph Pierson	E. E.	Wilmington
McElwee, Irviene Reed	Ch. E.	Wilmington
McKay, Herman	A.	Wilmington
McKinney, William	E. E.	Wilmington
McMillan, James Gordon	A. & S.	Wilmington
McMullen, Joshua Willard	A.	Lincoln University, Pa.
Meier, Charles Gottlieb	Ch. E.	Wilmington
Meredith, John Hazel	A. & S.	Goldsboro, Md.
Messick, Edward Hewes	E.	Lewes
Middleton, Leonard	C. E.	Wilmington

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MAR 29 1917

DELAWARE COLLEGE BULLETIN

VOLUME XII NEW SERIES NUMBER 2

FEBRUARY, 1917

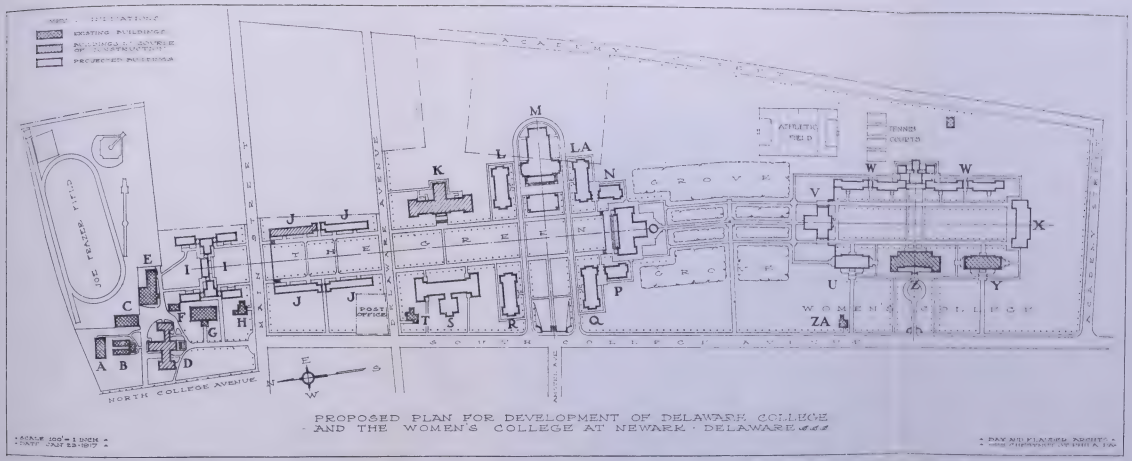
ANNUAL CATALOGUE

1916-1917

PUBLISHED QUARTERLY BY THE COLLEGE

NEWARK, DELAWARE

Entered June 22, 1904, at Newark, Delaware, as second class matter, under Act of Congress of July 19, 1894



PROPOSED GROUP PLAN FOR THE DEVELOPMENT OF DELAWARE COLLEGE AND THE WOMEN'S COLLEGE OF DELAWARE

DELAWARE COLLEGE

A—Heating Station
B—Greenhouses
C—Gymnasium
D—Old College Hall
E—Mechanical Hall
F—Experimental Laboratory
G—Recitation Hall
H—Purnell House
II—Fraternity House Group
JJJJ—Dormitories
K—Wolf Hall—Agriculture
L, LA—Recitation Halls
M—Auditorium
N—Unassigned
O—Library
P—Administration
Q—Unassigned
R—Unassigned
S—Engineering
T—Infirmary

WOMEN'S COLLEGE

U—Unassigned
V—Y. W. C. A.
WW—Dormitories
X—Unassigned
Y—Dormitories
Z—College Hall

ZA—President's House

NOTE—The buildings shaded are existing or in course of erection.

UNIVERSITY OF ILLINOIS LIBRARY
MAR 9 1917

CATALOGUE

OF

DELAWARE COLLEGE

1916-1917

WITH

ANNOUNCEMENTS FOR 1917-1918

PUBLISHED BY THE COLLEGE
NEWARK, DELAWARE

1917

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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JULY

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AUGUST

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1918

JANUARY

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JULY

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SEPTEMBER

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OCTOBER

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DECEMBER

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CALENDAR

1917		
January 29	Monday	Second term begins, 8.15 a. m.
March 6	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 5	Thursday	Easter recess begins, 5.05 p. m.
April 10	Tuesday	Easter recess ends, 8.15 a. m.
May 30	Wednesday	Memorial Day: a holiday
June 4-9		Final Examinations
June 10	Sunday	Address—Young Men's Christian Association, 11.00 a. m.
		Baccalaureate Sermon, 8.00 p. m.
June 11	Monday	Class Day
June 12	Tuesday	Meeting of the Trustees, 10.30 a. m.
		Alumni Day
June 13	Wednesday	Commencement Exercises, 10.30 a. m.
		Alumni Luncheon and meeting, 1.00 p. m.
June 15-16		Examinations for Admission
	SUMMER VACATION	
June 25	Monday	Summer School for Teachers opens.
August 3	Friday	Summer School for Teachers closes.
September 18-19		Examinations for Admission
September 20	Thursday	First term begins, 8.15 a. m.
November 27	Tuesday	Meeting of the Trustees, 10.30 a. m.

November 29	Thursday	Thanksgiving Day: a holiday
December 22	Saturday	Christmas recess begins, 12.10 p. m.
1918		
January 3	Thursday	Christmas recess ends, 8.15 a. m.
January 17-26		Mid-Year Examinations
January 28	Monday	Second term begins, 8.15 a. m.
March 5	Tuesday	Meeting of the Trustees, 10.30 a. m.
March 28	Thursday	Easter recess begins, 5.05 p. m.
April 2	Tuesday	Easter recess ends, 8.15 a. m.
May 30	Thursday	Memorial Day: a holiday
June 3-8		Final Examinations
June 9	Sunday	Address—Young Men's Christian Association, 11.00 a. m.
		Baccalaureate Sermon, 8.00 p. m.
June 10	Monday	Class Day
June 11	Tuesday	Meeting of the Trustees, 10.30 a. m.
June 12	Wednesday	Commencement Day
June 14-15		Examinations for Admission

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TRUSTEES OF DELAWARE COLLEGE

Ex Officio

The Governor, JOHN G. TOWNSEND, JR., Selbyville

The President of the State Board of Education, CLIFFORD J. SCOTT, Wilmington

The Master of the State Grange, HORACE L. DILWORTH, Centreville

The President of the College, SAMUEL CHILES MITCHELL

H. G. M. KOLLOCK, M. D., Newark.....1882
J. HARVEY WHITEMAN, ESQ., Newark..... 1892
CHARLES B. EVANS, ESQ., Newark..... 1894
WILLIAM T. LYNAM, ESQ., Wilmington..... 1897
CHARLES S. CONWELL, Camden..... 1897
DANIEL W. CORBIT, Odessa..... 1899
L. HEISLER BALL, M. D., Marshallton..... 1900
W. WATSON HARRINGTON, ESQ., Dover..... 1900
LEWIS W. MUSTARD, Lewes..... 1900
SAMUEL H. MESSICK, Bridgeville..... 1902
JAMES E. DUTTON, Seaford..... 1904
JOHN BIGGS, ESQ., Wilmington..... 1905
SAMUEL H. DERBY, Woodside..... 1905
JOSEPH H. HOSSINGER, Newark..... 1908
THOMAS DAVIS, ESQ., Wilmington..... 1908
SAMUEL J. WRIGHT, Newark..... 1910
EDWARD D. HEARNE, ESQ., Georgetown..... 1910
HENRY RIDGELY, ESQ., Dover..... 1911
CHARLES M. CURTIS, ESQ., Wilmington..... 1911
EVERETT C. JOHNSON, Newark..... 1911
HENRY B. THOMPSON, Wilmington..... 1912
EBEN B. FRAZER, Newark..... 1913
H. RODNEY SHARP, Wilmington..... 1915
W. H. HEALD, ESQ., Wilmington..... 1915
HAMILTON M. BARKSDALE, Wilmington..... 1915
CHARLES BARKER, Milford..... 1916
EDWARD A. EVANS, Cheswold..... 1916

OFFICERS OF THE BOARD OF TRUSTEES

HENRY B. THOMPSON, *President*
SAMUEL H. MESSICK, *Vice President*
CHARLES B. EVANS, *Secretary and Treasurer*

EXECUTIVE COMMITTEE

Henry B. Thompson, *Chairman*

Dr. S. C. Mitchell
Dr. H. G. M. Kollock
H. Rodney Sharp
Charles M. Curtis
J. H. Hossinger
Henry Ridgely

FINANCE COMMITTEE

——————— *Chairman*

William H. Heald
E. B. Frazer
W. W. Harrington
C. B. Evans

GROUNDS AND BUILDINGS

Dr. H. G. M. Kollock, *Chairman*

H. Rodney Sharp
S. J. Wright
E. B. Frazer
E. C. Johnson

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J. H. Hossinger, *Chairman*

D. W. Corbit
S. H. Derby
S. H. Messick
H. L. Dilworth

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S. H. Messick
Dr. S. C. Mitchell
C. B. Evans

Clifford J. Scott

WOMEN'S COLLEGE

Charles M. Curtis, *Chairman*

Henry Ridgely
Thomas Davis

PLAN OF DEVELOPMENT

H. Rodney Sharp, *Chairman*

H. M. Barksdale
Henry B. Thompson

FACULTY

SAMUEL CHILES MITCHELL, PH. D. ..... *President*

A. M., Georgetown College, Ky., 1888; Ph. D., University of Chicago, 1899; LL. D., Brown University, 1910; President of Delaware College, and of The Women's College of Delaware, 1914——.

GEORGE ABRAM HARTER, PH. D... *Mathematics and Physics*

A. B., St. John's College, 1878; Ph. D., St. John's College, 1893; Tutor in Latin and Mathematics, Ibid., 1878-1880; Professor of Mathematics, 1885-1888; President, 1896-1914; Professor of Mathematics and Physics, 1888——.

ELISHA CONOVER, A. M. ..... *Ancient Languages and Literatures*

A. B., Dickinson College, 1884; A. M., Dickinson College, 1887; Professor of Latin, Wilmington Conference Academy, 1888-1891; Professor of Latin and Greek, Montpelier Seminary, Vermont, 1891-1895; Professor of Ancient Languages and Literatures, 1895——.

EDWARD LAURENCE SMITH, A. M..... *Modern Languages and Literatures*

A. B., Delaware College, 1896; A. M., Delaware College, 1899; Graduate Student in Romance Languages, Université de Paris and Collège de France, 1900-1901; Instructor in German, French, and Spanish, Brooklyn Polytechnic Institute, 1901-1902; Instructor in Modern Languages, Delaware College, 1902-1904; Professor of Modern Languages and Literatures, 1904——; Dean, 1915——; Secretary of the Faculty, 1916——.

MERRILL VAN GIESEN SMITH, M. E. *Mechanical Engineering*

M. E., Stevens Institute of Technology, 1896; Instructor in Mechanical Engineering, University of Pennsylvania, 1898-1900; Acting Professor of Mechanical and Electrical Engineering, Delaware College, 1901; Professor of Mechanical Engineering, Clarkson College of Technology, 1901-1904; Professor of Mechanical Engineering, 1904——.

CLINTON OSBORNE HOUGHTON, A B..... *Biology*

A. B., Cornell University, 1902; Entomologist, Experiment Station and Associate Professor of Zoology, 1902-1908; Professor of Biology, 1908——.

WILBUR OWEN SYPHERD, PH. D. .....*English*

A. B., Delaware College, 1896; S. B., University of Pennsylvania, 1900; A. M., Harvard, 1901; Ph. D., Harvard, 1906; Instructor in English, University of Wisconsin, 1901-1903; Professor of English, Delaware College, 1906——.

HARRY HAYWARD, S. M. .....*Animal Husbandry*

S. B. in Agriculture, Cornell, 1894; S. M., Cornell, 1901; Assistant in Dairy Husbandry, 1894-1896, Instructor, 1896-1898, Assistant Professor, 1898-1902, Pennsylvania State College; Professor Animal and Dairy Husbandry, New Hampshire State College 1902-1903; Assistant Chief, Dairy Division, Bureau of Animal Industry, United States Department of Agriculture, 1903; Organizer and Director of Department of Agriculture, Mt. Hermon (Mass.) Boys' School, 1903-1906; Director of Experiment Station and Dean of Department of Agriculture, 1906——.

CLARENCE ALBERT SHORT, S. M. .....*Mathematics*

S. B., Delaware College, 1896; S. M., Ibid, 1905; Instructor in Mathematics, 1902-1906; Professor of Mathematics and Engineering, 1906——.

CHARLES ANDREW MCCUE, S. B. .....*Horticulture*

S. B., Michigan Agricultural College, 1901; Instructor in Horticulture, Michigan Agricultural College, 1904-1907; Assistant Horticulturist, Michigan Agricultural Experiment Station, 1906-1907; Professor of Horticulture, 1907——; Horticulturist, Experiment Station, 1907——.

ARTHUR ELLIOTT GRANTHAM, S. B. .....*Agronomy*

A. B., University of Indiana, 1903; S. B., University of Missouri, 1905; Assistant in Agronomy, Missouri Agricultural Experiment Station, 1904-07; Instructor in Agronomy, University of Missouri, 1905-07; Professor of Agronomy, and Agronomist to the Experiment Station, 1907——.

CHARLES LYNDALL PENNY, A. M., SC. D. .....*Chemistry, Mineralogy, and Geology*

A. B., Bucknell University, 1879; A. M., Ibid., 1882; Sc. D., Ibid., 1898; Chemist, Delaware College Experiment Station, 1888-1907; Professor of Agricultural Chemistry, Pennsylvania State College, 1907-1909; Professor of Chemistry, 1909——.

EARNEST VANCOURT VAUGHN, PH. D. .....*History and Economics*

L. B., University of Missouri, 1900; A. M., University of Missouri, 1904; Ph. D., University of Pennsylvania, 1910; Instructor in History, University of Missouri, 1906-1911; Professor of History and Economics (State of Delaware Chair of History), 1911——.

RAYMOND CLINTON REED,* PH. B., D. V. M...*Bacteriology and Hygiene*

Ph. B., Cornell, 1896, D. V. M., Cornell, 1901; Instructor in Pathology and Bacteriology, Cornell, 1896-1902; Professor of Bacteriology and Hygiene, 1911——.

FIRMAN THOMPSON, S. B. .....*Agricultural Chemistry*

S. B., University of Michigan, 1897; New York Experiment Station, 1897-1898; Hawaiian Sugar Planters' Experiment Station, 1899-1900; Queensland Government Sugar Experiment Station, 1900-1901; Hawaiian Sugar Planters' Experiment Station, 1902-1907; Assistant Professor of Chemistry, North Dakota Agricultural College, 1907-1908; Chemist, Experiment Station, 1908——; Professor of Agricultural Chemistry, 1913——.

THOMAS FRANKLIN MANNS, PH. D....*Plant Pathology and Soil Bacteriology*

S. B., North Dakota Agricultural College, 1901; S. M., Ibid., 1903; Ph. D., University of Pennsylvania, 1913; Assistant Botanist, North Dakota Agricultural College, 1903-1904; Assistant Botanist, Ohio Experiment Station, 1907-1911; Soil Bacteriologist, Ohio Experiment Station, 1911-1912; Plant Pathologist and Soil Bacteriologist, Experiment Station, and Professor of Plant Pathology and Soil Bacteriology, 1912——.

GEORGE ALBERT KOERBER, E. E.....*Electrical Engineering*

E. E., Lafayette College, 1908; Instructor in Electrical Engineering and Physics, Ibid., 1908-1912; Professor of Electrical Engineering, 1913——.

GEORGE SYLVESTER COUNTS, PH. D. .....*Psychology and Education*

A. B., Baker University, 1911; Ph. D., University of Chicago, 1916; Professor of Psychology and Education, 1916——.

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*Resigned, February, 1917.

ALLAN REGINALD CULLIMORE, S. B.....*Civil Engineering*

S. B. in Civil Engineering, Massachusetts Institute of Technology, 1907; Assistant in Department of Civil Engineering, Ibid., 1907-1908; Professor of Civil Engineering, Toledo University, 1911-1912; Professor of Civil Engineering and Dean of the College of Industrial Science, Toledo University, 1912-1916; Professor of Civil Engineering and Dean of Engineering, 1916——.

WILLIAM FERGUSON HOEY, JR. .....*Military Science and Tactics*

First Lieutenant, Infantry, U. S. Army.
Commandant of Cadets and Professor of Military Science and Tactics, 1916——.

HAROLD EDWARD TIFFANY, S. M. .....*Chemistry*

S. B., Bucknell University, 1905; S. M., Ibid., 1906; Instructor in Chemistry, 1906-1911; Assistant Professor of Chemistry, 1911——.

ZACHARYA HARRY SRAGER, S. B *Mechanical and Electrical Engineering*

S. B., Rutgers College, 1909; Instructor in Mechanical and Electrical Engineering, 1910-1913; Assistant Professor of Mechanical and Electrical Engineering, 1913——.

GEORGE ELLIOTT DUTTON, A. M. .....*English*

A. B., Delaware College, 1904; A. M., Harvard University, 1911; Instructor in English, University of Missouri, 1908-1910; Instructor in English, 1911-1913; Assistant Professor of English, 1913——.

ARTHUR CRAIG WHITTIER, S. B. ...*Agricultural Chemistry*

S. B., University of Maine, 1905; Massachusetts Experiment Station, 1905-1906; Maine Experiment Station, 1906-1908; Ohio Experiment Station, 1908-1911; Experiment Station, 1911——; Assistant Professor of Agricultural Chemistry, 1913——.

HOWARD KENT PRESTON, C. E. .....*Mathematics and Engineering*

C. E., Lafayette College, 1909; Instructor in Mathematics and Drawing, Ibid., 1910-1912; Instructor in Mathematics and Engineering, 1912-1915; Assistant Professor of Mathematics and Engineering, 1915——.

RAYMOND RANDAL PAILTHORP, S. B. .....*Horticulture*

S. B., Michigan Agricultural College, 1913; Assistant Horticulturist, Delaware College Agricultural Experiment Station and Instructor in Horticulture, 1913-1915; Assistant Professor of Horticulture, 1915——.

WILLIAM JAMES MCAVOY, C. E. .....*Athletics and Mathematics*

C. E., Lafayette College, 1908; Physical Director and Instructor in Mathematics, 1912-1916; Physical Director and Assistant Professor of Mathematics, 1916——.

KENT ROBERTS GREENFIELD, PH. D. .....*History and Economics*

A. B., Western Maryland College, 1911; Ph. D., Johns Hopkins University, 1915; Instructor in History and Economics, 1915-1916 and Assistant Professor, 1916——.

HORACE VANDERVEER CORY, S. B. .....

S. B., Rutgers, 1915; Extension Department, New Jersey Experiment Station, 1915; Instructor in Poultry Husbandry, New Jersey Agricultural College (Rutgers), 1915-1916; Assistant Professor of Poultry Husbandry, 1916——.

JOHN ASBURY ELLIOTT, PH. D. .....*Plant Pathology*

A. B., Fairmount College, 1913; A. M., University of Kansas, 1914; Ph. D., University of Illinois, 1916; Associate Plant Pathologist, Experiment Station and Assistant Professor of Plant Pathology, 1916——.

MARK LOVEL NICHOLS, S. B. .....*Agronomy*

S. B., Ohio State University, 1912; Agronomist, T. N. Vail Agricultural School, 1915-1916; Assistant Agronomist, Experiment Station and Assistant Professor of Agronomy, 1916——.

MANSELL FARQUHAR GRIMES, S. B. ....*Animal Husbandry*

S. B., Pennsylvania State College, 1914; Instructor in Animal Husbandry, Pennsylvania State College, 1914-1916; Assistant Professor of Animal Husbandry, 1916——.

LEWIS AUGUSTUS BELDING, M. E. .....*Mechanical Engineering*

M. E., Stevens Institute of Technology, 1912; Instructor in Mechanical Engineering, Ibid., 1912-1913; Instructor in Electrical Engineering, Ibid., 1913-1916; Assistant Professor of Mechanical Engineering, 1916——.

FRED E. CLARK, PH. D. .....*Business Administration*
A. B., Albion College, 1912; Ph. D., University of Illinois, 1916; Instructor in Business Administration, University of Michigan, 1916-1917; Assistant Professor of Business Administration, 1917——.

REEVES DYER STRING .....*Shop Work*
Instructor in Shop Work, 1908——.

FREDERICK JULIUS POHL, A. M. .....*English*
A. B., Amherst College, 1911; A. M., Columbia University, 1914; Instructor in English, Ohio Wesleyan University, 1911-1914; Instructor in English, 1915——.

CHARLES HENRY RAWLINS, JR., PH. D. .....*Mathematics*
Ph. B., Dickinson, 1910; A. M., Ibid, 1913; Ph. D., Johns Hopkins, 1916; Instructor in Mathematics, Williamsport Dickinson Seminary, 1910-1913; Instructor in Mathematics, 1916——.

PAUL WINSLOW BOUTWELL, PH. D. .....*Chemistry*
S. B., Beloit College, 1910; A. M., University of Wisconsin, 1912; Ph. D., University of Wisconsin, 1912-1916; Instructor in Chemistry, 1916——.

CLAUDE CARL SPIKER, A. M. .....*Modern Languages*
A. B., West Virginia University, 1912; Student in Madrid, Spain, and Tours, France, summer of 1913; A. M., University of Chicago, 1916; Instructor in Latin and French, Glenville Normal School, Glenville, W. Va., 1912 1913; Instructor in Romance Languages, West Virginia University, 1913-1915; Instructor in Modern Languages, 1916——.

ALBERT WILHELM BERNHARDT, A. B. ..*Modern Languages*
A. B., Cornell College, Iowa, 1911; Instructor in Modern Languages, 1916——.

STANDING COMMITTEES OF THE FACULTY

Admission: Professor Short, Chairman; Dean Hayward, Professor Sypherd.

Advanced Degrees: Professor Vaughn, Chairman; Professor Sypherd, Professor Reed, Professor Thompson, and Assistant Professor Srager.

Advanced Standing: Dean Smith, Chairman; Dean Hayward; Dean Cullimore.

Athletics: Faculty Representatives on the Athletic Council—Dean Smith, President; Professor McCue, Vice-President; Assistant Professor McAvoy, Manager.

Board of Advisers: Dean Smith, Chairman. For the Senior Class, Professor Koerber; for the Junior Class, Assistant Professor Greenfield; for the Sophomore Class, Assistant Professor Preston; for the Freshman Class, Assistant Professor Dutton.

Extension: Professor Vaughn, Chairman; Professor Reed, Professor Short.

Lectures: Professor McCue, Chairman; Dean Smith, Professor Sypherd.

Prizes: Professor Sypherd, Chairman; Professor Conover, Professor Reed.

Publicity: Assistant Professor Dutton, Chairman; Assistant Professor Greenfield, Assistant Professor Preston, Assistant Professor Grimes.

Schedule: Professor Smith, Chairman; Professor Conover, Assistant Professor Greenfield.

Scholarship: Dean Hayward, Chairman; Professor Vaughn, Professor Sypherd, Professor Smith, Dean Smith, Professor Short, Dean Cullimore.

Student Entertainments: Assistant Professor Dutton, Chairman; Professor Sypherd, Assistant Professor Preston, Assistant Professor McAvoy.

Students' Schedules: Arts and Science—Professor Sypherd, Chairman; Professor Conover, Professor Vaughn. Agriculture—Dean Hayward, Chairman; Professor Grantham, Professor McCue. Engineering—Dean Cullimore, Chairman; Professor Smith, Professor Koerber.

EXPERIMENT STATION STAFF

Harry Hayward, S. M., Director
Charles A. McCue, S. B., Horticulturist
Arthur E. Grantham, A. B., S. B., Agronomist
Firman Thompson, S. B., Chemist
Thomas F. Manns, Ph. D., Plant Pathologist
John Asbury Elliott, Ph. D., Associate Plant Pathologist
A. C. Whittier, S. B., Associate Chemist
Mark L. Nichols, S. B., Assistant Agronomist
H. V. Cory, S. B., Poultry Husbandman
Mansell F. Grimes, S. B., Assistant Animal Husbandman
Raymond R. Pailthorp, S. B., Assistant Horticulturist
Lester W. Tarr, S. B., Assistant Chemist

Marion C. Butterworth, A. B., Secretary
Mary Little, Stenographer
Cecilia A. O'Rourke, Stenographer

AGRICULTURAL EXTENSION

Harry Hayward, S. M., Director
Elizabeth Jefferson, S. B., Home Economics
Frank A. Carroll, S. B., Dairy Husbandry
Horace V. Cory, S. B., Poultry Husbandry

COUNTY AGENTS

Levi H. Cooch, New Castle
Howard H. Zimmerley, S. B., Kent
Ward C. Pelton, S. B., Sussex

STATE BOARD OF HEALTH LABORATORY

Herbert J. Watson, P. D., Bacteriologist

DELAWARE COLLEGE

LOCATION

DELAWARE COLLEGE is situated at Newark, a town of 2000 inhabitants, about half-way between Philadelphia and Baltimore on the main lines of the Pennsylvania and Baltimore and Ohio Railroads running from New York to Washington. The climate is equable; the currounding country is attractive; and the town itself has all modern improvements, including an excellent supply of artesian well water and a complete sewerage system.

FOUNDATION

Delaware College was chartered as a private college in 1833 by an Act of the Delaware Legislature and was first opened to students in May, 1834. As a result of a succession of misfortunes the college was closed from 1859 to 1870. It was reopened in 1870, having meanwhile been designated by an Act of the Delaware Legislature as beneficiary under the Act of Congress known as the "Morrill Bill," which apportioned to each of the several states large areas of public lands to form the basis of endowments for colleges devoted especially to the teaching of Agriculture, the Mechanic Arts, and Military Tactics. The college was thus under combined private and State ownership until 1913, when it came into the sole posession of the State. It is now in the full sense of the word a State College. The Board of Trustees consists of 28 members, together with the Governor of the State, the President of the College, the Master of the State Grange, and the President of the State Board of Education, all of whom are members ex officio.

BUILDINGS AND GROUNDS

Extensive additions are now being made to the grounds and buildings of the college. In May, 1915, a large tract of land lying between Delaware College and the Women's College of Delaware was given to the college by an unnamed donor. On this land buildings will be erected as needed. In process of construction at the present time are Wolf Hall, which will house the Departments of Agriculture, Chemistry, Bacteriology, and Biology; Old College Hall, which will be used as a Commons and for various other purposes; and the First Dormitory, which will accommodate 59 students. These buidings will all be completed by September, 1917. The grading of the newly acquired land, including the planting of trees and the laying out of walks and the green, has been begun and will be finished, as far as possible, in the spring and summer of 1917.

Frazer Field, the gift of several members of the Frazer family of Newark, affords excellent facilities for outdoor sports and games.

Connected with the college, and used for purposes of instruction and experimentation, is the State Farm, a farm of 217 acres.

The buildings of The Women's College of Delaware, affiliated with Delaware College, are located on a plot of nineteen acres, adjoining the campus of the college.

FINANCIAL SUPPORT

The college is supported by the State of Delaware, by Federal appropriations, and by contributions from Alumni and other friends of the college. Through an unnamed donor, the college has recently received gifts amounting to more than $1,000,000, a sum which has made possible the improvements which are now under way, and has also provided an adequate fund for maintenance.

SCOPE OF THE WORK

The following Courses of Instruction are offered by Delaware College:

I **Arts and Science,** a four years' course, leading to the degree of Bachelor of Arts or Bachelor of Science. See pages 38 to 40.

II **Agriculture,** a four years' course, leading to the degree of Bachelor of Science. See pages 41 to 44.

III **Engineering**—Civil, Mechanical, Electrical, and Chemical, four years' courses, leading to the degree of Bachelor of Science. See pages 45 to 53.

Tuition is free to all students from the State of Delaware. The college constitutes a part of our system of free public instruction. In its scheme of education, the culture of liberal learning and the practical usefulness of the applied sciences are equally emphasized.

Extension Work

Agriculture. The Agricultural Extension work of Delaware College is supported by a Federal appropriation known as the Smith-Lever fund, supplemented by State appropriations. The work is carried on largely by County Agents, one of whom is located in each county, by a woman trained in home administration, who spends practically the whole of her time in the field, and by dairy and poultry field agents. The function of these agents is to supply the people with the most helpful information, and render any service possible in the development of the agricultural resources of the State.

The college co-operates with the field workers by supplying material and furnishing lectures, as well as by planning and assisting in inaugurating new projects.

General Lectures. The members of the Faculty of Delaware College and of the Women's College of Dela-

ware will, as far as their time permits, deliver lectures before the schools, women's clubs, and other organizations throughout the State. The list of lecturers and lectures is given on pages 121 to 124.

Summer School

For the benefit of teachers and other who are qualified to do the work, a Summer School is held for six weeks each summer at Delaware College. Professor Counts, of the Department of Psychology and Education, directs the work of the school. Elementary instruction in fundamental school subjects, including methods of teaching, is offered to teachers in the primary grades. Advanced instruction is offered to teachers in the higher grades. Each course is in charge of a specialist who is also a skilled instructor. The faculty is composed largely of members of the faculty of Delaware College. The session of 1917 will open on June 25 and close on August 3. Information will be furnished by the Director of the Summer School.

The following courses were given at the 1916 session: Elementary Agriculture; Art and Industrial Work, elementary and advanced courses; Elementary Latin; Primary Methods, School Management; Elementary English Grammar, Elementary Composition, Advanced Composition, Shakspere; Political Geography; United States History, Civics; International Relations; Elementary Arithmetic, Advanced Arithmetic, Algebra, Plane Geometry; Physics; Physical Training; Physiology and Hygiene; Vocal Music.

The Experiment Station

The Delaware College Experiment Station, a research department of the college, was made possible by an Act of Congress passed in 1887, known as the Hatch Act. Under the Provisions of this Act each state received an annual appropriation of $15,000 for the estab-

lishment of an Agricultural Experiment Station. This was supplemented in 1906 by a similar act known as the Adams Act, which carried an annual appropriation of $15,000 for the use of the Agricultural Experiment Stations that had been established under the law of 1887.

The Experiment Station has a library, research laboratories, and a separate organized staff. It is investigating problems in the fields of Agronomy, Horticulture, Chemistry, Plant Pathology, Soil Bacteriology, and Animal Husbandry. The results of its investigations are published in the form of bulletins, which are distributed free of charge to those interested.

The Women's College of Delaware

Affiliated with Delaware College is the Women's College of Delaware, established by the State in September, 1914. The college offers four courses of instruction leading to degrees:

I **Arts and Science,** a four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Education,** a four years' course leading to the degree of Bachelor of Science.

III **Home Economics,** a four years' course leading to the degree of Bachelor of Science.

IV **Agriculture,** a four years' course leading to the degree of Bachelor of Science.

In addition to these regular courses, two years' courses in Education and in Home Economics are offered to students who are qualified to do the work. Tuition is free to students from the State of Delaware. Information in regard to the college may be obtained from the Dean of the Women's College.

REQUIREMENTS FOR ADMISSION

Students are admitted either upon examination at the college or upon certificates from accredited schools or from other colleges or universities. Examinations are held in June and September according to the schedule on pages 35-36. Certificates from schools should be presented as early as possible during the summer preceding the session of the college which students wish to attend. Blank certificates may be had upon application.

GENERAL REGULATIONS

Candidates for admission to the Freshman class must be at least 16 years of age and of good moral character.

It is desired that every candidate for admission shall have completed a four-year high school course.

Candidates wishing to receive entrance credits on subjects not offered in the schools from which they present certificates are required to take examinations in such subjects on days prescribed in the Calendar of the college.

Students should enter at the **beginning of the first term,** because the subjects which are begun at that time are not repeated in the second term.

Students will not be permitted to enter the college in the first term after October 15, unless they have completed an amount of work equivalent to the work already done by the classes which they wish to enter.

SPECIFIC REQUIREMENTS

Fourteen units are required for admission to all courses leading to degrees. No student will be admitted with more than two conditions.

The term **unit** means the equivalent of five recitations a week for one year in one subject.

The following units are required of all:

English	3 units
Mathematics (Plane Geometry and Algebra)	2½ "
Modern Language	2 "
History	1 unit
Science	1 "
Total	9½ "

Additional units to the number of 4½ must be offered from the following list.

Mathematics	
Solid Geometry	½ unit
Foreign Languages	
Greek	1, 2, 3, or 4 units
Latin	1, 2, 3, or 4 units
German	1, 2, 3, or 4 units
French	1, 2, 3, or 4 units
History	
Ancient	1 unit
Mediaeval and Modern	1 unit
English	1 unit
United States	½ or 1 unit
Civics	½ unit
Science	
Botany	½ or 1 unit
Chemistry	1 unit
Physics	1 unit
Physical Geography	½ or 1 unit
Physiology	½ unit
Zoology	½ or 1 unit
Vocational Subjects	Units to be determined

Arts and Science

In addition to the 9½ units required of all, candidates may offer any of the subjects in the foregoing list in order to make fourteen units. Candidates for the degree of A. B. must offer four units of Latin or Greek, or take a condition in this subject not exceeding 2 units.

Agriculture

In addition to the 9½ units required of all, candidates must select 4½ units from the foregoing list of elective subjects.

Engineering

In addition to the 9½ units required of all, candidates must offer 4½ additional units, including Solid Geometry (½ unit). The required science for candidates for admission to courses in Engineering is Physics. Students who have to take in college the additional course in Solid Geometry or an extra year in Modern Languages will find it difficult to finish the course in Engineering in four years. Beginning with the academic year 1917-1918, no student will be admitted to a course in Engineering who has not satisfied completely the entrance requirements in Mathematics.

NOTE

All candidates for admission are examined in English Composition in order to test their ability to do the required English of the Freshman year. Examinations are held in June and September. Candidates are advised to take the examination in June. Those who fail will have the opportunity of working privately on the subject during the summer or of taking a course in English in the six weeks' Summer Session.

Detailed Explanation of the Requirements for Admission

English

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

English Grammar and Composition

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description, and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted efforts of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

Literature

The second object is sought by means of two lists of books, headed respectively **Reading** and **Study,** from which may be framed a progressive course in literature covering four years. In connection with both lists, the

student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

a **Reading.** The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units[1] are to be selected, two from each group:

Group I The Old Testament, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther[2]; the Odyssey, with the omission, if desired, of books I, II, III, IV, V, XV, XVI, XVII; the Iliad, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Vergil's Aeneid. The Odyssey, Iliad, and Aeneid should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II Shakspere: Merchant of Venice; The Tempest; As You Like It; Twelfth Night; Midsummer Night's Dream; Romeo and Juliet; King John; Richard II; Richard III; Henry V; Coriolanus; Julius Caesar; Macbeth; Hamlet.

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[1] Each unit is set off by semicolons.
[2] See Delaware College Bulletin, N. S., vol. 12, no. 1, 1916.

Group III Prose Fiction. Malory's Morte d'Arthur (about 100 pages); Bunyan's Pilgrim's Progress, Part I; Swift's Gulliver's Travels (voyages to Lilliput and Brobdingnag); DeFoe's Robinson Crusoe, Part I; Goldsmith's Vicar of Wakefield; Frances Burney's Evelina; Scott's Novels (any one); Jane Austen's Novels (any one); Maria Edgeworth's Castle Rackrent, or The Absentee; Dickens' Novels (any one); Thackeray's Novels (any one); George Eliot's Novels (any one); Mrs. Gaskell's Cranford; Kingsley's Westward Ho! or Hereward, the Wake; Reade's The Cloister and the Hearth; Blackmore's Lorna Doone; Hughes' Tom Brown's Schooldays; Stevenson's Treasure Island, or Kidnapped, or Master of Ballantrae; Cooper's Novels (any one); Poe's Selected Tales; Hawthorne's The House of the Seven Gables, or Twice Told Tales, or Mosses from an Old Manse; a collection of Short Stories by various standard writers.

Group IV Essays, Biography, etc. Addison and Steele's The Sir Roger de Coverley Papers, or Selections from the Tatler and Spectator (about 200 pages); Selections from Boswell's Life of Johnson (about 200 pages); Franklin's Autobiography; Irving's Sketch Book (about 200 pages), or Life of Goldsmith; Southey's Life of Nelson; Lamb's Essays of Elia (about 100 pages); Lockhart's Life of Scott (about 200 pages); Thackeray's Lectures on Swift, Addison, and Steele in the English Humourists; Macaulay's Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederic the Great, Madame d'Arblay (any one); Trevelyan's Life of Macaulay (about 200 pages); Ruskin's Sesame and Lilies, or Selections (about 150 pages); Dana's Two Years before the Mast; Selections from Lincoln including at least the two inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and the Letter to Horace Greeley, together with a brief memoir or estimate; Parkman's The Oregon Trail; Thoreau's Walden; Lowell's Selected Essays (about 150 pages); Holmes' The Autocrat of the Breakfast Table;

Stevenson's An Inland Voyage, and Travels with a Donkey; Huxley's Autobiography, and selections from Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; a collection of Essays by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of Letters by various standard writers.

Group V Poetry. Palgrave's Golden Treasury (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's Golden Treasury (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under (**b**); Goldsmith's The Traveller, and The Deserted Village; Pope's The Rape of the Lock; A collection of English and Scottish ballads, as, for example, some Robin Hood ballads, The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens, and a selection from later ballads; Coleridge's The Ancient Mariner, Christabel, and Kubla Khan; Byron's Childe Harold, Canto III or IV, and The Prisoner of Chillon; Scott's The Lady of the Lake, or Marmion; Macaulay's The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry; Tennyson's The Princess, or Gareth and Lynette, Lancelot and Elaine, and The Passing of Arthur; Browning's Cavalier Tunes, The Lost Leader, How They Brought the Good News From Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus—, Instans Tyrannus; Arnold's Sohrab and Rustum, and The Forsaken Merman; Selections from American poetry, with special attention to Poe, Lowell, Longfellow, and Whittier.

b Study This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the under-

standing of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

Group I Drama. Shakspere's Julius Caesar, Macbeth, Hamlet.

Group II Poetry. Milton's L'Allegro, Il Penseroso, and either Comus or Lycidas; Tennyson's The Coming of Arthur, The Holy Grail, and The Passing of Arthur; the selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's Golden Treasury (First Series).

Group III Oratory. Burke's Speech on Conciliation with America; Macaulay's Two Speeches on Copyright, and Lincoln's Speech at Cooper Union; Washington's Farewell Address, and Webster's First Bunker Hill Oration.

Group IV Essays. Carlyle's Essay on Burns, with a selection from Burns's poems; Macaulay's Life of Johnson; Emerson's Essay on Manners.

Examination

However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling, or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies.

and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include:

A General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under (a) **Reading** above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

B A test on the books prescribed for (b) **Study**, which will consist of questions upon their content, form, and structure, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of the works, and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their other works, and the periods of literary history to which they belong.

History and Civics

(a) History. Ancient, Mediaeval and Modern, English, United States. The requirement is a regular year's work in one of these subjects.

(b) Civics. Whether given separately or in connection with United States History, this work must be the equivalent of a regular course pursued for a half year. Considerable attention should be given to the actual workings of government.

Mathematics

(a) Algebra. The four fundamental operations, with emphasis placed upon type forms in multiplication and division, factoring, highest common factor, least common multiple, fractions, fractional equations, simultaneous equations of first degree, evolution, theory of exponents, radicals, quadratic equations of one unknown quantity, and solution of problems. Emphasis should be placed on factoring and solution of literal equations.

(b) Plane Geometry. The usual theorems and constructions of good text books. An important part of the work consists in the solution of original exercises, including loci and numerical problems. Accuracy and acuteness in thinking are desired more than mere geometrical knowledge.

(c) Solid Geometry. The usual theorems and constructions of good text books; relations of lines and planes; properties of prisms, pyramids, cylinders, cones; the sphere and spherical triangle. Emphasis should be placed on problems of mensuration, loci, and the relation of parts in spherical triangles and polygons.

(d) Advanced Algebra. Convergency and Summation of Series, Binomial Theorem, Permutations and Combinations, Undetermined Coefficients, Logarithms, Theory of Equations, and Determinants.

(e) Plane Trigonometry. Trigonometric ratios and their relations; derivation of general ratios; proofs of general formulas, especially trigonometric functions of sum of two angles, difference of two angles, and multiple angles; proving of identities; use of logarithms and solution of right and oblique triangles.

Physics

Candidates for admission who may bring certificates from an accredited high school stating that they have completed one year's work of five recitations a week

covering the elementary principles of Physics and including laboratory exercises of at least two hours a week will be accepted as satisfying the entrance requirements in Physics.

As a requirement for admission of other applicants, in addition to passing an examination in the subject as covered in the ordinary high school text book on Physics, they must submit satisfactory notes on the laboratory work they may have done.

Latin

1 The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less in amount than Caesar, Gallic War, I-IV; Cicero, the orations against Catiline, for Manilian Law, and for Archias; Vergil, Aeneid, I-VI .

2 The amount of reading specified above shall be selected by the schools from the following authors and works; Caesar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters, and De Senectute) and Sallust (Catiline and Jugurthine War); Vergil (Bucolics, Georgics, and Aeneid) and Ovid (Metamorphoses, Fasti, and Tristia).

3 Grammar and Composition. The examination in grammar and composition will demand a thorough knowledge of all irregular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The Roman method of pronunciation is used.

Greek

Xenophon, Anabasis, Books I-IV. Homer, Iliad, Books I-III. A thorough knowledge of Greek Grammar.

Modern Languages

(a) German, Elementary. 1, careful drill in pronunciation; 2, the memorizing and frequent repetition of easy colloquial sentences; 3, drill upon the rudiments of grammar, that is, upon the inflection of the articles, of such nouns as belong to the language of every-day life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word order; 4, abundant easy exercises designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; 5, the reading of from 100 to 125 pages of graduated texts.

(b) German, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in German (b) will not be given credit for it unless they have passed also the examination in German (a).

Applications should be accompanied by a statement of the text books used and the number of pages translated.

(a) French, Elementary. 1, careful drill in pronunciation; 2, the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural nouns, the inflection of adjectives, participles, and pronouns; the use of the personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; 3, abundant easy exercises, designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in reproduction of natural forms of expression; 4, the reading of from 100 to 125 pages of graduated texts.

(b) French, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in French (b) will not be given credit for it unless they have passed also the examination in French (a).

Applications should be accompanied by a statement of the text books used and the number of pages translated.

Science

One year's work of 36 weeks, five recitations weekly, of high school grade, covering the elementary principles of any one of the several sciences, will be accepted as an entrance requirement. The student in addition to the examination must submit his notes on laboratory or field work of the year.

ADMISSION TO ADVANCED STANDING

Candidates for entrance to an advanced class in any of the courses are required either to sustain examinations in all studies of the courses up to the point at which they seek admission, or to present from other colleges certificates covering such studies.

ENTRANCE EXAMINATIONS

Entrance examinations will be held at the college in Newark on Friday and Saturday, June 15 and 16, 1917, beginning at 9 a. m.; also on Tuesday and Wednesday, September 18 and 19, 1917, at the same hours.

Ancient History or English History—9.00-10.30, Friday, June 15, and Tuesday, September 18.

Algebra—10.30-12.30, Friday, June 15, and Tuesday, September 18.

Geometry—1.30-3.00, Friday, June 15 and Tuesday, September 18.

Latin—3.15-4.30, Friday, June 15, and Tuesday, September 18.

Greek and Physics—9.00-10.30, Saturday, June 16, and Wednesday, September 19.

English—10.30-12.30, Saturday, June 16, and Wednesday, September 19.

History of the United States and Civil Government—1.15-2.45, Saturday, June 16, and Wednesday, September 19.

Solid Geometry—2.45-4.30, Saturday, June 16, and Wednesday, September 19.

Hours for examinations in other subjects will be arranged for with the candidates who offer such subjects.

COURSES OF STUDY

Delaware College offers the following courses of study:

I **Arts and Science**—A four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Agriculture**—A four years' course leading to the degree of Bachelor of Science in Agriculture.

III **Engineering** — Civil, Mechanical, Electrical, Chemical—A four years' course leading to the degree of Bachelor of Science in the special field of study.

CHOICE OF STUDY

Students may, with the approval of their parents or guardians, enter any one of the departments; or they may select such studies as they are prepared to pursue, when circumstances make it advisable not to enter a regular course. Except in the case of mature students who may desire to do special work in any department, it is strongly urged that all students for admission prepare themselves for undertaking the work of a regular course. Opportunity is offered students of sufficient maturity and preparation, who do not wish to take any of the regular courses, to pursue special studies determined by some definite end in view.

Each special student is required to have at least fifteen recitations, or their equivalent, weekly, unless especially excused for cause.

Changes from one course to another may be made only at the opening of a term, with the approval of the Faculty and the consent of the parent or guardian.

COURSE IN ARTS AND SCIENCE

This course is designed to meet the requirements of a liberal education and to lay the foundation for professional and business careers. In accordance with this general aim considerable freedom in the choice of studies is allowed, particularly in the last two years of the course. The studies of the Freshman year are virtually prescribed.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 128 credit term-hours of work in addition to Military Science and Physical Training. During the Senior year, every candidate for graduation must submit a satisfactory thesis to the head of the Department in which he has taken his major.

Graduates from the course in Arts and Science who have offered for admission four years of Latin or Greek, or who have completed in college an equivalent amount of work will receive the degree of Bachelor of Arts; all other graduates will receive the degree of Bachelor of Science.

Prescribed Studies

	Term Hours	Credits
English	16	16
Mathematics	8	8
Modern Language	12	12
Science (Chemistry, Zoology, Botany, or Physics	12	12
History and Economics	12	12
	60	60
Military Drill	12	6
Physical Training	4	2

FRESHMAN YEAR

First Term	H.*	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Mathematics, 1, 2	4	4	Mathematics, 3, 4	4	4
Language—Latin, French, or German	3	3	Language—Latin, French, or German	3	3
History, 1	3	3	History, 1	3	3
Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6	Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6
Military Science, 1	3	1.5	Military Science, 1	3	1.5
Physical Training, 1	1	0.5	Physical Training, 1	1	0.5

* The capital letters H. and C. refer to Actual Hours and Credit Hours respectively.

SOPHOMORE, JUNIOR, AND SENIOR YEARS

At the beginning of the Sophomore year, every candidate for the degree of Bachelor of Arts or Bachelor of Science shall select from the following groups a major study, in which he shall complete thereafter 18 hours of work. In addition, he must take from the group from which he selects his major at least one additional course after the Freshman year.

During these three years students must take in addition to the required work in Military Science and Physical Training all prescribed subjects not completed in the Freshman year and elective courses sufficient to make a total of thirty credit term-hours each year.

Group A	**Group B**
Greek	Biology
Latin	Chemistry
French	Mathematics and Physics
German	
English	
History and Economics	

Elective Courses

	First Term	Second Term
Ancient Languages, 1	3	3
Ancient Languages, 2	3	3
Ancient Languages, 3	3	3
Ancient Languages, 5	3	3
Ancient Languages, 6	3	3
Ancient Languages, 7	3	3
Ancient Languages, 10	3	3
Bacteriology, 1	3	3
Bacteriology, 2	1	1
Bacteriology, 5	3-5	3-5
Biology, 1	3	3
Biology, 2, 3	2	2
Biology, 4	3	3
Business Administration, 1, 2, 3, 4	3	3
Chemistry, 1	3.5	2
Chemistry, 2	3	3
Chemistry, 3	1.5	–
Chemistry, 4	–	1.5
Chemistry, 6	1.5	–
Chemistry, 7	3	3
Chemistry, 8	3	–
Chemistry, 9	1	1
Chemistry, 10	6	6
Chemistry, 11	1.5	–
Chemistry, 12	–	2
Chemistry, 13	1	–
Chemistry, 14	–	1
Chemistry, 17	3	3
Civil Engineering, 34	1	1
English, 3	3	–
English, 5	3	–
English, 8	3	–
English, 10	1	1
English, 12	–	2
English, 14	1	1
English, 15	–	3
English, 16	–	3
History, 5	3	–
History, 6	–	3
History, 7	3	–
History, 8	–	3

	First Term	Second Term
History, 9	–	3
History, 10	3	–
History, 11	–	3
History, 13	3	3
History, 14	3	–
History, 15	–	3
History, 16	2 or 3	2 or 3
History, 17	3	3
Horticulture, 14	3	–
Mathematics, 6	4	–
Mathematics, 7	–	4
Mathematics, 8	3	3
Mathematics, 9	2	2
Mathematics, 12	2	–
Mathematics, 13	–	2
Mathematics, 14	2	–
Mathematics, 15	–	2
Mineralogy, 1	3	–
Mineralogy, 2	–	3
Military Science, 3, 4	5	2.5
Modern Languages, 1	3	3
Modern Languages, 2	3	3
Modern Languages, 3	3	3
Modern Languages, 5	3	3
Modern Languages, 6	3	3
Modern Languages, 7	3	3
Modern Languages, 8	3	3
Modern Languages, 9	3	3
Modern Languages, 10	3	3
Modern Languages, 11	3	3
Modern Languages, 13	3	3
Physics, 1	3	3
Physics, 2, 3	2	2
Physics, 7	2	2
Physics, 8	2	2
Plant Pathology	–	3
Psychology, 1	3	–
Psychology, 2	–	3
Psychology, 3	3	–
Psychology, 4	–	3
Psychology, 5	3	–
Psychology, 6	–	3

COURSES IN AGRICULTURE

FOUR YEARS' COURSE

The course in Agriculture leading to a degree combines a technical course with as much cultural training as possible. It includes a foundation in the fundamental sciences upon which is built a vocational superstructure.

The work is planned for the preparation of men who desire to become teachers of Agriculture, farm managers, investigators, or specialists in some one of the various phases of Agriculture. To aid those who are undecided as to which lines they are best adapted, presentation subjects of the various courses are offered early in the course. The opportunity to specialize in any of the major branches is reserved until the Junior and Senior years.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 136 credit term-hours of work in addition to military science and physical training.

Although a considerable amount of practice work is given throughout the course, both in the laboratories and upon the farm, prospective students are urged to spend a year upon a well managed farm before entering college, to the end that they may more fully appreciate the course of study.

If it is impracticable to get this experience before entering college, students will be required to spend at least two summers, or their equivalent, before the Senior year, in practice work upon a farm. All candidates for a degree must pass an examination in farm practice before October 15th of the Senior year.

Candidates for a degree in Agriculture must choose at the beginning of the Junior year, either Agronomy, Animal Husbandry, or Horticulture for a major course. A minimum of 16 credit hours must be taken in the department in which the student is majoring.

A student in Agriculture, at his discretion, may take during his course fifteen hours of elective subjects offered in departments other than Agriculture, provided that such elections do not interfere with required or back work. The remainder of the electives must be taken from Agricultural subjects, herein described.

A student will not be allowed to take more than 21 credit hours in any semester without first obtaining permission from the Dean of Agriculture.

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Mathematics, 1, 2	4	4	Modern Language, 1 or 10	3	3
Modern Language, 1 or 10	3	3	Biology, 4	5	3
History, 2	1	1	Chemistry, 1, 3	5	3.5
Biology, 4	5	3	Agriculture, 1	3	2
Chemistry, 1	5	3.5	Animal Husbandry, 1	4	3
Military Science, 1	3	1.5	Military Science, 1	3	1.5
Physical Training, 1	1	0.5	Physical Training, 1	1	0.5

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	4	Modern Language, 2 or 11	3	3
Chemistry, 2, 3	6	4.5	Chemistry, 2, 4	6	4.5
Physics, 1, 2	7	5	Physics, 1, 2	7	5
Horticulture, 1	4	3	Agronomy, 1	4	3
Military Science, 2	3	1.5	Military Science, 2	3	1.5
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Biology, 1	5	3	Biology, 1	5	3
Bacteriology, 1	5	3	Bacteriology, 1	5	3
Agricultural Chemistry, 1	5	3	Agricultural Chemistry, 1	5	3
Agronomy, 4	5	3	Agronomy, 5	5	3
Horticulture, 3	4	3	Elective Agriculture (Minimum)	–	3
Animal Husbandry, 3	4	3	Plant Pathology, 1	5	3
Elective			*Elective*		
Military Science, 3	5	2.5	Military Science, 3	5	2.5

SENIOR YEAR

First Term	H.	C.
Farm Management (Agronomy 7)	5	3
Genetics (Hort 14)	3	3
History, 5	3	3
Economics (H 12)	3	3
Electives Agriculture (Minimum)	–	6
Elective		
Military Science, 4	5	2.5

Second Term	H.	C.
History, 6	3	3
Sociology (H 9)	3	3
Soil Bacteriology, 1	–	3
Elective Agriculture (Minimum)	–	6
Elective		
Military Science, 4	5	2.5

Elective Courses

	First Term	*Second Term*
Agronomy, 2	3	–
Agronomy, 3	–	3
Agronomy, 6	3	–
Agronomy, 8	–	2
Agronomy, 9	3	–
Agronomy, 10	1	1
Agronomy, 11	–	3
Animal Husbandry, 5	–	2
Animal Husbandry, 6	3	–
Animal Husbandry, 7	3	–
Animal Husbandry, 8	–	2
Animal Husbandry, 9	1	–
Animal Husbandry, 10	–	1
Animal Husbandry, 11	–	3
Agricultural Chemistry, 2	3	–
Agricultural Chemistry, 3	–	3
Bacteriology, 3	–	3
Bacteriology, 4	2	–
Bacteriology, 5	3	3

	First Term	*Second Term*
Biology, 2	2	2
Biology, 3	2	2
Dairying, 1	–	3
Horticulture, 2	–	3
Horticulture, 4	–	3
Horticulture, 5	–	2
Horticulture, 6	–	3
Horticulture, 7	3	–
Horticulture, 8	–	3
Horticulture, 9	–	3
Horticulture, 10	–	2
Horticulture, 11	3	–
Horticulture, 12	1	–
Horticulture, 13	–	1
Horticulture, 15	–	3
Military Science, 3, 4	5	2.5
Poultry Husbandry, 1	–	2
Poultry Husbandry, 2	4	–
Poultry Husbandry, 3	–	4
Soil Bacteriology, 1	–	3

Special Courses in Agriculture

Opportunities for special courses in Agriculture are provided for those who, for various reasons, are unable to pursue a four years' course, leading to a degree.

In order to become a special student, one must have had one year of recent experience on a farm and be at

least nineteen years of age. An applicant must satisfy the faculty of his ability to do the work assigned and give assurance of a sincere desire to avail himself of the opportunities offered by this department of the college.

Special students do not follow a prescribed program or course of study but are at liberty to elect such studies as they are prepared to take. The schedule of studies of special students must be filed with and approved by the Dean of Agriculture.

Special students are required to take all examinations and maintain a satisfactory standard of scholarship in order to hold their place in college.

COURSES IN ENGINEERING

CIVIL ENGINEERING

The Department of Civil Engineering provides a rigorous training in the fundamentals of civil engineering, supplemented by studies of a distinctly broadening character. The aim of the course is to develop men who can creditably fill positions where a breadth of view and a thorough training are prime requisites.

In the fourth year, one and only one of the four options must be taken. These options provide a solid basis for Municipal, Structural, Railroad, or Highway work.

Freshmen and Sophomores are required to attend the summer school of Surveying, which will be held during the two weeks immediately after the close of college in June.

REQUIREMENTS FOR GRADUATION

FRESHMEN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Mathematics, 16	4	4	Mathematics, 17	4	4
Civil Engineering, 34	2	1	Civil Engineering, 34	2	1
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
Mechanical Engineering, 20	2	2	Mechanical Engineering, 20	2	2
Mechanical Engineering, 21	3	1,5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
History, 2	1	1	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	3
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Physics, 3	4	4	Physics, 4	3	3
Physics, 5	4	2	Physics, 6	2	1
Civil Engineering, 15	4	3	Civil Engineering, 15	4	3
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 22	3	1.5
Military Science, 2	3	1.5	Electrical Engineering, 9	2	2
Physical Training, 2	1	0.5	Military Science, 2	3	1.5
			Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Mineralogy, 1	3	3	Mineralogy, 2	3	3
Bacteriology, 2	1	1	Bacteriology, 2	2	1
Civil Engineering, 32	2	1	Civil Engineering, 32	2	1
Civil Engineering, 6	3	3	Civil Engineering, 13	3	3
Civil Engineering, 16	5	3.5	Civil Engineering, 16	7	5.5
Electrical Engineering, 11	2	2	Mechanical Engineering, 1	3	3
Elective			*Elective*		
Military Science, 3	5	2.5	Military Science, 3	5	2.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	Civil Engineering, 1		
Civil Engineering, 1			Civil Engineering, 3	4	4
Civil Engineering, 3	4	4	Civil Engineering, 4	4	4
Civil Engineering, 4	4	4	Civil Engineering, 2	2	2
Civil Engineering, 7	3	3	*Elective*		
Civil Engineering, 33	3	1.5	English, 7	1	1
Elective			or		
Military Science, 4	5	2.5	Civil Engineering, 5	2	2
			Military Science, 4	5	2.5

Structural

Civil Engineering, 12	5	5	Civil Engineering, 31	8	6

Municipal

Civil Engineering, 11..	5	5	Civil Engineering, 10..	4	4
			Civil Engineering, 37..	5	2.5

Highway

Civil Engineering, 8..	4	4	Civil Engineering, 8...	4	4
			Civil Engineering, 38..	5	2.5

Railroad

Civil Engineering, 9..	4	4	Civil Engineering, 9...	4	4
			Civil Engineering, 39..	5	2.5

MECHANICAL AND ELECTRICAL ENGINEERING

This department offers two courses, one in Mechanical Engineering and one in Electrical Engineering, each leading to the degree of Bachelor of Science. The courses are designed to teach the principles of Mechanical and Electrical Engineering and to train young men to meet successfully the problems which an engineer may encounter. Besides offering instruction in purely technical studies, the courses also provide the elements of a liberal education, including the subjects of English Composition, oral and written, English Literature, History, French or German, Mathematics, Physics, and Chemistry.

Both courses are the same for the first three years. During the fourth year, students who take one course or the other pursue separately the subjects pertaining to their particular course. Many studies, however, remain common to both courses.

The department has a well-equipped wood-working and machine shop and mechanical and electrical laboratories and drafting-room. Furthermore, besides the regular afternoon periods of shopwork, there is a supplementary term in Sophomore shopwork, which will begin on June 14, 1917, and will last for two weeks.

Students are charged a moderate fee for shop and laboratory courses, which fee is intended to cover the cost of materials used and to meet incidental expenses.

Students are required to furnish all instruments and materials used in the drafting-room. The materials must conform strictly to the requirements of the department, and the instruments must meet with the approval of the instructor.

Every candidate for graduation is required to present a satisfactory thesis which shall embody the results of some investigation which he has personally made. These theses must be typewritten and must be accompanied by such drawings and other sheets as are necessary to illustrate and explain the subject. The theses must be ap-

proved by the English Department before they will be accepted.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Mathematics, 16	4	4	Mathematics, 17	4	4
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
Civil Engineering, 34	2	1	Civil Engineering, 34	2	1
Mechanical Engineering, 20	2	2	Mechanical Engineering, 20	2	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
History, 2	1	1	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Physics, 3	4	2	Physics, 4	2	1
Physics, 5	4	4	Physics, 6	3	3
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 41	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 43		3	Mechanical Engineering, 41	3	1.5
Military Science, 2	3	1.5	Electrical Engineering, 9	2	2
Physical Training, 2	1	0.5	Military Science, 2	3	1.5
			Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.
Mathematics, 8	3	3
Mathematics, 11	5	5
Civil Engineering, 32	2	1
Civil Engineering, 6	3	3
Mechanical Engineering, 24	4	4
Mechanical Engineering, 42	3	1.5
Electrical Engineering, 1	2	2
Electrical Engineering, 30	3	1.5
Elective		
Military Science, 3	5	2.5

Second Term	H.	C.
Mathematics, 8	3	3
Mathematics, 11	5	5
Civil Engineering, 32	2	1
Mechanical Engineering, 1	3	3
Mechanical Engineering, 24	4	4
Mechanical Engineering, 42	3	1.5
Electrical Engineering, 2	2	2
Electrical Engineering, 30	3	1.5
Elective		
Military Science, 3	5	2.5

SENIOR YEAR—MECHANICAL ENGINEERING

First Term	H.	C.
English, 7	1	1
Civil Engineering, 4	4	4
Mechanical Engineering, 3	2	2
Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1
Mechanical Engineering, 9	1	1
Mechanical Engineering, 25	6	3
Mechanical Engineering, 30	6	3
Electrical Engineering, 10	1	1
Electrical Engineering, 3	4	4
Electrical Engineering, 32	3	1.5
Elective		
Military Science, 4	5	2.5

Second Term	H.	C.
English, 7	1	1
Civil Engineering, 4	4	4
Mechanical Engineering, 3	2	2
Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1
Mechanical Engineering, 9	1	1
Mechanical Engineering, 25	6	3
Mechanical Engineering, 30	6	3
Electrical Engineering, 10	1	1
Electrical Engineering, 3	4	4
Electrical Engineering, 32	3	1.5
Elective		
Military Science, 4	5	2.5

SENIOR YEAR—ELECTRICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Mechanical Engineering, 4	4	4	Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1	Mechanical Engineering, 6	1	1
Mechanical Engineering, 31	3	1.5	Mechanical Engineering, 31	3	1.5
Electrical Engineering, 3	4	4	Electrical Engineering, 3	4	4
Electrical Engineering, 5	1	1	Electrical Engineering, 5	1	1
Electrical Engineering, 8	1	1	Electrical Engineering, 8	1	1
Electrical Engineering, 10	1	1	Electrical Engineering, 10	1	1
Electrical Engineering, 20	6	3	Electrical Engineering, 20	6	3
Electrical Engineering, 31	6	3	Electrical Engineering, 31	6	3
Elective			*Elective*		
Military Science, 4	5	2.5	Military Science, 4	5	2.5

CHEMICAL ENGINEERING

The course in Chemical Engineering is designed to give thorough instruction in Chemistry and also in some of the more important engineering branches. In addition to the general instruction in Chemistry it includes special work in chemical analysis, organic preparations, electro-analysis, industrial chemistry, with the analysis of some of the more important materials and products, water analysis, and gas analysis. It also includes such branches of mechanical and electrical engineering as are particularly useful in the management of manufacturing establishments. Aside from its special purpose this course offers an excellent scientific education. Every candidate for graduation will be required to prepare in his Senior year a thesis giving the results of his own investigations of some approved subject. This course leads to the degree of Bachelor of Science in Chemical Engineering.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 10	3	3	Modern Language, 10	3	3
Mathematics, 16	1	1	Mathematics, 17	4	4
Mechanical Engineering, 20	2	2	Mechanical Engineering, 20	2	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
History, 2	1	1	Military Science, 1	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Traniing, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 11	3	3	Modern Language, 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Physics, 3	4	4	Physics, 4	3	3
Physics, 5	4	2	Physics, 6	2	1
Chemistry, 2	3	3	Chemistry, 2	3	3
Chemistry, 4	3	1.5	Chmistry, 6	3	1.5
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 44	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 43		3	Electrical Engineering, 9	2	2
Military Science, 2	3	1.5	Military Science, 2	3	1.5
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Chemistry, 5	3	3	Chemistry, 5	3	3
Chemistry, 7	6	3	Chemistry, 7	6	3
Chemistry, 9	1	1	Chemistry, 9	1	1
Chemistry, 11	3	1.5	Mineralogy, 2	3	3
Mineralogy, 1	3	3	Mechanical Engineering, 1	3	3
Electrical Engineering, 1	2	2	Electrical Engineering, 2	2	2
Elective			*Elective*		
Military Science, 3	5	2.5	Military Science, 3	5	2.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Chemistry, 8	3	3	Chemistry, 10	12	6
Chemistry, 10	12	6	Chemistry, 12	4	2
Chemistry, 13	2	1	Chemistry, 14	2	1
Chemistry, 14	2	1	Chemistry, 15	3	3
Chemistry, 15	3	3	Chemistry, 17	3	3
Chemistry, 17	3	3	*Electives*		
Electives			(From non-technical subjects)	3	3
(From non-technical subjects)	3	3	Military Science, 4	5	2.5
Military Science, 4	5	2.5			

ADVANCED DEGREES

The degree of Master of Arts or Master of Science will be awarded upon the satisfactory completion of a resident course of study in Arts, Science, Agriculture, or Engineering extending over not less than one year. The candidate must have taken his first degree in some college of approved standing and must show by his previous record that he is capable of doing satisfactory work for the advanced degree. At the beginning of the year in which he expects the degree he shall select a major subject and one or two minor subjects and he shall take in these subjects the equivalent of at least 12 hours work. He must also attain a high standard of scholarship.

The examination for the Master's Degree may be oral or written, at the option of the professor in charge. In all cases a meritorious thesis must be submitted in the major subject.

A graduate of any of the courses in Engineering will, after three years of practical and successful work as an Engineer, be entitled to the professional degree of C. E., M. E., E. E., or Ch. E., according to the course he may have pursued. One college year before coming up for the degree the candidate must signify his intention, and also map out a definite and satisfactory course of work. He must in addition submit a satisfactory subject for a thesis. The examination, held at Delaware College, will cover the work mapped out and the thesis.

In exceptional cases students may do the actual work for the Master's Degree **in absentia** under conditions determined by the committee on Graduate Study.

An incidental fee of $10 must be paid by the candidate for a higher degree before he will be admitted to the final examinations.

Two copies of all theses submitted for degrees must be left with the college as its property.

SUBJECTS OF INSTRUCTION

By Departments

In this detailed statement of the subjects of instruction, the number of credit term hours is printed in italics at the end of each course.

Two hours of laboratory work are counted as equivalent to one lecture or recitation hour.

AGRICULTURE

A1 Elementary Agriculture. The aim of this course is to present the scope of the various fields of agricultural activity. It is given under the direction of the departments of Agronomy, Animal Husbandry, and Horticulture. Required of all Freshmen in Agriculture. One lecture and two laboratory hours a week.

Four credit hours

AGRICULTURAL CHEMISTRY

Professor Thompson and Assistant Professor Whittier

The courses in Agricultural Chemistry are designed to instruct the student in the nature and properties of materials pertaining to Agriculture as well as in the nature of the chemical changes taking place in agricultural and physiological processes. He is also instructed in the proper interpretation of chemical analyses, being thereby enabled to judge the quality of many materials and estimate their value.

AC 1 Agricultural Chemistry. (Prerequisites: C 1, 2, 3, and 4). The chemistry of soils, fertilizers, feeding stuffs, dairy products, insecticides. Lectures, recitations, and laboratory work throughout the year. Required of students in Agriculture.

Professor Thompson *Six credit hours*

AC 2 Advanced Agricultural Chemistry. Plant Chemistry. (Prerequisite: AC 1). The chemistry of the plant products. The function of the mineral plant foods

in plant metabolism. The composition of plants at different stages of growth with special reference to the organic constituents. Use of the Polariscope. The action of enzymes, etc. Lectures, recitations, and laboratory. Elective for Seniors in Agriculture. First term.

PROFESSOR THOMPSON *Three credit hours*

AC 3 Advanced Agricultural Chemistry. Animal Chemistry. (Prerequisite: AC 1). The chemistry of the animal body. Composition of foods and the chemical changes taking place during digestion. Use of calorimeter in determining energy values of foods. Chemistry of immunity, etc. Lectures, recitations, and laboratory. Elective for Seniors in Agriculture. Second term.

PROFESSOR THOMPSON *Three credit hours*

AGRONOMY

Agronomy is the science of the field, the soil, and its crops.

The soil is studied with reference to its functions as the home of the plant. The fundamental principles of soil management for crop production are especially emphasized. The study of soils presupposes a fair understanding of the principles of physics, chemistry, and plant physiology.

Field crops are studied from the standpoint of the adaptation and improvement of plants. A study is made of the economical and business management of the field and its crops. The study of field crops presupposes a general knowledge of botany.

A field of twenty-five acres devoted to experimental and research work in Agronomy is used to supplement class and laboratory work. At least one visit to representative farms of the State will be required of Juniors and Seniors in Agronomy.

Agr 1 Field Crop Production. A general course dealing with the history, adaptation, distribution, and

classification of cereal and forage crops. Special attention is given to the principles of cultivation, and to the methods of harvesting and marketing which obtain under Eastern conditions. Lectures, recitations, and laboratory work. Second term.

ASSISTANT PROFESSOR NICHOLS *Three credit hours*

AGR 2 Cereal Crops. (Prerequisites: Agr 1; B 4). The cultivation, harvesting, and marketing of grain crops. Attention in detail is given to the various methods of production and to the cost. Varieties and types of grain groups are considered, together with the principles of improvement by selection and breeding. Judging of corn, wheat, oats, etc., and a study of market grades and classification; preservation and testing of field crop seeds. Lectures, recitations, and laboratory work. First term.

ASSISTANT PROFESSOR NICHOLS *Three credit hours*

AGR 3 Forage Crops. (Prerequisites: Agr 1; B 4). A study of the various types and varieties of grasses and leguminous crops used for hay and pasture. Special attention is given to cultural methods, propagation, and value of the various plants for feed and soil improvement. Lectures, recitations, and laboratory work. Second term.

ASSISTANT PROFESSOR NICHOLS *Three credit hours*

AGR 4 Soil Physics. (Prerequisites: C 1, Ps 1, 2). A study of the origin, formation, classification, and function of soils, the relation of soil texture to temperature, air, and moisture, and to plant growth; the effect of methods of tillage and drainage on the physical properties of soils. Lectures, recitations, and laboratory work. First term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 5 Soil Fertility. (Prerequisites: C 1, 2, 3, 4, and 5; Agr 4). The relation of plant food to the productive capacity of the soil and a study of the methods by which the fertility may be obtained and increased. The ultimate effect of various rotations and of different sys-

tems of farming on the fertility of soils. A study of the composition of manures, fertilizers, and amendments, with a comparison of their agricultural and commercial value for different crops. Lectures, recitations, and laboratory work. Second term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 6 Farm Equipment. Laying out the fields; the location, arrangement, design, construction, and cost of farm buildings, especially barns, granaries, silos, etc.; the adaptability, efficiency, construction, operation, and durability of field machinery; power machinery including steam and gasoline engines; the different kinds of fences, cost, construction, and durability; construction of roads, walks, and drains. Lectures, recitations, and practice work. First term.

ASSISTANT PROFESSOR NICHOLS *Three credit hours*

AGR 7 Farm Management. This course is designed to summarize the student's agricultural training and experience and apply it to the efficient management of the farm as a whole. The organization of the farm as a business enterprise, its arrangement with reference to size and shape of field; systems of crop and livestock management; the relation of fixed to circulating capital; the relation of labor to income; farm accounts, etc. Lectures and seminars. First term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 8 Plant Breeding. (Prerequisites: Agr 2, 3, 4, 5; Hort. 14). The improvement and breeding of field crops including the grains, grasses, and legumes; selection; results obtained by various investigators. Lectures, assigned reading, demonstrations, and laboratory work. Second term.

PROFESSOR GRANTHAM *Two credit hours*

AGR 9 Investigation of Special Soils. (Prerequisites: C 5, 6, 7; Agr 4 and 5). The determination of the nature and quantity of the elements of fertility; effec-

upon various crops of different fertilizers added to soils, as determined by pot culture and pot experiments; systematic study of similar work of experiment stations and investigators. Assigned readings, reviews, and laboratory work. First term.

PROFESSOR GRANTHAM *Three credit hours*

AGR 10 Methods of Field Experimentation. (Prerequisites: Agr 2, 3, 4, 5, 8, 9). A course designed for students intending to take up experiment station work. Methods of plotting land for soil and crop experiments; check systems; interpretation of results. The literature of this and other countries pertaining to experimental work will be carefully studied.

PROFESSOR GRANTHAM *Two credit hours*

AGR 11 Thesis and Seminar. Original work on an approved line of investigation. Second term.

PROFESSOR GRANTHAM *Three credit hours*

ANCIENT LANGUAGES AND LITERATURES

PROFESSOR CONOVER

Throughout the course the aim is to enable the student to acquire facility and quickness in reading at sight and familiarity with the ancient order of thought. Word-meaning is fixed by inspecting form, derivation, and comparison with synonyms. The authors are selected with a view to their representative character. The public and private life of the Greeks and Romans and their influence on modern literature and civilization are continually kept before the minds of the students. English derivatives and words kindred to all Indo-European tongues are frequently noted, and the general principles of comparative philology are explained and applied.

In addition to the department library, which contains the Delphini edition of Latin writers, the Attic orators and dramatists, etc., the department of classical philology in the general library is steadily growing. It contains

bound volumes of the American Journal of Philology and of the Harvard Studies in Classical Philology. The American Journal of Philology is kept on file in the reading room.

LATIN

AL 1 Cicero, De Senectute and De Amicitia. Ovid, Metamorphoses, etc. Prose Composition.

Six credit hours

AL 2 Livy, 21st or 22d book. Horace, Odes, Epodes, Satires, Epistles. Prose Composition.

Six credit hours

AL 3 Tacitus, Germania and Agricola. Plautus, Captives and Trinummus. Juvenal, Satires.

Six credit hours

AL 4 Seneca, Tragedies or Moral Essays. Terence, Adelphoe and Andria. Quintilian, Books X and XII. Lectures on Latin Literature and Inscriptions.

Six credit hours

GREEK

AL 5 White's First Greek Book. Anabasis, I, II,

Six credit hours

AL 6 Anabasis III, IV. Homer, Iliad, I-III. Herodotus VII, VIII.

Six credit hours

AL 7 Lysias, Orations. Plato, Apology and Crito. Aristophanes, Plutus or Clouds.

Six credit hours

AL 8 Demosthenes, Orations. Lucian, Dialogues. Aeschylus, Prometheus Bound.

Six credit hours

AL 9 Greek Prose Composition.

Four credit hours

AL 10 Greek Testament.

Four credit hours

ANIMAL HUSBANDRY

PROFESSOR HAYWARD AND ASSISTANT PROFESSOR GRIMES

The work in Animal Husbandry is designed to familiarize the student with some of the principles underlying this important industry. The class room and laboratory instruction is supplemented by work with the live stock on the College Farm and by visits to the many flocks, herds, and studs of Delaware and Pennsylvania as well as by attending some of the best live stock shows which are held annually within easy reach of the college.

AH 1 Types and Market Classes of Farm Animals. A study of the development of the types of farm animals., the characteristics of the breeds within the types, and the relation of market requirements to the live stock industry. Laboratory practice in the judging and selecting of the various classes and in the simple handling of farm animals will supplement the class room work. It will also include practice in the cutting and curing of meats. Two lectures and two laboratory hours a week. Second term.

ASSISTANT PROFESSOR GRIMES *Three credit hours*

AH 3 Feeding Farm Animals. The principles of animal nutrition; the composition and qualities of feeding stuffs; the feeding of horses and a brief survey of the feeding of dairy cattle and swine. Two laboratory and two lecture hours a week. First term.

ASSISTANT PROFESSOR GRIMES *Three credit hours*

AH 5 Advanced Judging. (Prerequisites: AH 1 and 2). The aim of this course is to train students in the selection of desirable sires and breeding females and for judging at fairs. The men who will represent the college in judging contests will be chosen largely from this class. Several of the excellent stock farms within a radius of fifty miles will be visited. Four laboratory hours a week. Second term.

ASSISTANT PROFESSOR GRIMES *Two credit hours*

AH 6 Breeds of Farm Animals. (Prerequisites: AH 1 and 2). A comprehensive study of the development of the breeds of live stock, the most noted sires and dams of the breeds, and the most successful lines of breeding. One lecture and four laboratory hours a weeks. First term.

ASSISTANT PROFESSOR GRIMES *Three credit hours*

AH 7 Live Stock Management. (Prerequisites: AH 1, 2, 3, and 4). The care, handling, and management of animals for market, show, and farm purposes. Considerable practice work with the animals on the college farm will be required. One lecture and four laboratory hours a week. First term.

ASSISTANT PROFESSOR GRIMES *Three credit hours*

AH 8 Animal Breeding. (Prerequisites: AH 6 and Hort 14). A presentation of the more practical phases of heredity, variation, correlation, prepotency, and environment, and of their application to the breeding of farm animals. Second term.

PROFESSOR HAYWARD *Two credit hours*

AH 9 Seminar. A weekly conference of those majoring in Animal Husbandry, with reports and discussions of current literature and activities pertaining to the live stock industry. Senior year. First term.

ASSISTANT PROFESSOR GRIMES *One credit hour*

AH 10 Seminar. A continuance of AH 9. Senior year. Second term.

One credit hour

AH 11 Thesis.

Three credit hours

BACTERIOLOGY AND HYGIENE

PROFESSOR REED

Ba 1 Bacteriology. Instruction in this subject will be given in the form of lectures, recitations, and laboratory work. It will consist of a study of morphology, biological characters, distribution and classification of bacteria, and the relation of bacteria to animal and plant life. In the laboratory the student will be instructed in the technique necessary for practical work in bacteriology, cleaning and sterilizing apparatus, making culture media, isolating and studying bacteria in cultures and under the microscope both in the living condition and in stained preparations. Both saprophytic and pathogenic organisms will be studied. Required of Juniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

Six credit hours

Ba 2 Hygiene. Instruction in this subject will be given by means of lectures and laboratory work, and will cover the principles of sanitation, the prevention of epidemics, and disinfection. Required of Juniors in Civil Engineering and elective for Juniors and Seniors in Arts and Science.

Two credit hours

Ba 3 Animal Hygiene. The object of this course is to study the methods of preserving the health of farm animals. Instruction in this subject will consist of lectures recitations, and demonstrations. Elective for Seniors in Agriculture. Second term.

Three credit hours

Ba 4 Bacteriology. This course is for special students in Agriculture. The relation of bacteria to animal and plant life and the principles of sterilization and disinfection will be emphasized. First term.

Two credit hours

Ba 5 Bacteriology. A research course. Laboratory work. Open to students who have taken Bacteriology 1.

Six to ten credit hours

BIOLOGY

PROFESSOR HOUGHTON

The aim of biological instruction is to give the student some knowledge of the various living things by which he is surrounded, as well as to develop habits of careful observation and comparison, and close and accurate methods of thinking.

Most of the time is spent in actual study in the laboratory, which is supplied with simple and compound microscopes, reference works, microtome, reagents, etc. There is also an excellent collection of illustrative specimens and charts.

B 1 Elementary Zoology. A study of the variations in the structure and life history of the different classes of animals, their habits and relations. The student secures a general knowledge of the principles of classification based upon the evolution of the animal kingdom, and the principles of Zoology. Selected types of the principal groups of animals from Protozoa to Mammalia, of which dissections, drawings, and notes are required, are studied in the laboratory. The course gives a comprehensive view of the science of Zoology to the student taking no further work, and forms a basis for advanced work. One recitation or lecture and four hours of laboratory work a week. Required of Juniors in Agriculture. Elective for Arts and Science students.

Six credit hours

B 2 Systematic and Economic Zoology. (Prerequisite: B 1). In this course the student becomes acquainted with a large number of our common vertebrates and learns something of their structure, life histories, habits, and economic importance. Much attention is given to the work of tracing typical specimens, representing as many groups

as possible, of Fishes, Batrachians, Reptiles, Birds, and Mammals, by means of keys which are based largely upon structural charaters. Thus the student gains a clear idea of the relation of forms and the characters upon which classifications are based. Dissections are made when necessary to understand and properly use the keys. Four hours laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Four credit hours

B 3 Economic Entomology. A course treating of the more inportant injurious insects of orchard, garden, and field crops, also the insect pests of domestic animals and the household. The work deals with their structure, life histories, and descriptions, and the most approved methods for their control. The most important forms are placed before the class for careful examination and comparison. Special emphasis is laid upon the necessity for the ready determination of species. Two recitations or one recitation and two hours of laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Four credit hours

B 4 General Botany. As is indicated by its title, this is a general course in botany which aims to give the student a comprehensive idea of the subject as a whole. The topics to which particular attention is given in the first term are as follows: seeds and seedlings; roots, stems, and leaves; the morphology, evolution, and taxonomy of the Thallophyta, Bryophyta, and Pteridophyta. In the second term the principal topics are as follows: the Gymnospermae; winter buds; the flower and fruit of the higher seed plants; the morphology and taxonomy of the Angiospermae; ecology and economic botany. One recitation or lecture and four hours of laboratory work a week. Required of Freshmen in Agriculture. Elective for Arts and Science students.

Six credit hours

BUSINESS ADMINISTRATION

PROFESSOR CLARK

The object of the courses in Business Administration is to train men in the fundamental facts and principles of modern business and finance. Students desiring to take these courses should ground themselves in Economics, History, and Sociology.

Bus 1 Accounting and Commercial Law. Elective for all students, preferably Juniors and Seniors. First term.

Three credit hours

Bus 2 Principles of Business Organization and Management, and Banking. Elective for all students, preferably Juniors and Seniors. Second term.

Three credit hours

Bus 3 Statistics, Insurance, and Transportation, Elective for all students, preferably Juniors and Seniors. First term.

Three credit hours

Bus 4 Corporation Finance and Investments, Scientific Management, and Problems in Marketing. Elective for all students, preferably Juniors and Seniors. Second term.

Three credit hours

CHEMISTRY

PROFESSOR PENNY, ASSISTANT PROFESSOR TIFFANY, AND DR. BOUTWELL

For students not seeking special preparation in chemistry, courses are offered in inorganic and organic chemistry, qualitative and quantitative analysis, and agricultural chemistry.

The instruction is given in lectures with experiments and by means of laboratory work. The time given to the subject and the courses taken vary with the general course of study pursued by the individual student.

A library of the standard works and a file of the principal journals are accessible to students.

C 1 **Inorganic Chemistry.** This course treats of the elements and their more important compounds with special reference to industrial uses. It consists of two hours of recitations or lectures and three hours of laboratory in the first term, and of two hours of recitations or lectures in the second term.

DOCTOR BOUTWELL *Three and a half credit hours in the first term and two credit hours in the second term*

C 2 **Organic Chemistry.** (Prerequisite: C 1). This course treats of the more important carbon compounds. Recitations and lectures.

PROFESSOR PENNY *Six credit hours*

C 3 **Introductory Qualitative Analysis.** (Prerequisite: C 1). This course is devoted chiefly to laboratory practice in the detection and separation of bases and acids. Three hours of laboratory. In the year 1917-18 this course will be given to Sophomores in the first term and to Freshmen in the second term.

ASSISTANT PROFESSOR TIFFANY AND DOCTOR BOUTWELL *One and a half credit hours*

C 4 **Introductory Quantitative Analysis.** (Prerequisites: C 1 and 3). This course consists of laboratory work. After preliminary practice, such branches of analysis are studied as are thought to be best adapted to the needs of each student. Three hours of laboratory and one-half hour of lectures. First term.

ASSISTANT PROFESSOR TIFFANY *One and a half credit hours*

C 5 Agricultural Chemistry. (Prerequisites: C 1 and 2). This course treats of the chemistry of plant life, of soils, of fertilizers, of feeding stuffs, and of spray materials. Lectures.

PROFESSOR PENNY *Six credit hours*

C 6 Qualitative Analysis. (Prerequisites: C 1 and 3). This course is supplementary to Course 3, which is a prerequisite; it is intended for students desiring a more thorough knowledge of the subject. Three hours. Second term.
term.

ASSISTANT PROFESSOR TIFFANY *One and a half credit hours*

C 7 Quantitative Analysis. (Prerequisites: C 1, 3, and 4). This course is supplementary to Course 4, which is a prerequisite. It will be adapted as far as possible to the needs of individual students. Six hours a week. Second term. (Beginning with September, 1919, this course will extend through the entire year.)

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

C 8 Industrial Chemistry. (Prerequisites: C 1 and 2). This course treats of the chemistry of several of the more important industrial processes. First term.

PROFESSOR PENNY *Three credit hours*

C 9 Chemical Calculations.

PROFESSOR PENNY *Two credit hours*

C 10 Technical Analysis. (Prerequisites: C 1, 3, and 4). This is a laboratory course intended for special students of Chemistry. It treats of the analysis of industrial materials and products. Twelve hours a week.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY *Twelve credit hours*

C 11 Organic Analysis and Organic Preparations. (Prerequisites: C 1, 2, 3, and 4). This is a laboratory course; it includes elementary organic analysis and the

preparation of some of the more important organic compounds. Three hours. First term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

One and a half credit hours

C 12 **Water Analysis.** (Prerequisites: C 1, 3, and 4). A laboratory course in the analysis of potable water and of water for industrial uses. Four hours. Second term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

Two credit hours

C 13 **Gas Analysis.** (Prerequisites: C 1, 2, 3, and 4). A laboratory course in the analysis of illuminating gas, and the like. Two hours. First term.

PROFESSOR PENNY *One credit hour*

C 14 **Electro-analysis.** (Prerequisites: C 1, 3, and 4). A laboratory course in the determination of metals by electrolytic methods. Two hours. Second term.

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

One credit hour

C 15 **Electrochemistry.** This course treats of electricity in its relation to chemistry with special application to industrial processes. Recitations and lectures.

Six credit hours

C 16 **Thesis.** Original work on an approved subject. Senior year.

C 17 **General and Physical Chemistry.** This course consists of lectures and recitations.

PROFESSOR PENNY *Six credit hours*

CIVIL ENGINEERING

PROFESSOR CULLIMORE, PROFESSOR SHORT, AND ASSISTANT PROFESSOR PRESTON

CE 1 **Thesis.** Each Senior student in civil engineering must prepare as a thesis, with such drawings as are necessary for its proper elucidation, a written description of some structure, machine, or process which he may have examined or designed.

CE 2 Contracts. Specifications. Business Law. Contracts; specifications; property; negotiable instruments; agency; partnership; insurance; carriers. Recitations and lectures. Required of Seniors in Civil Engineering. Second term.

Two credit hours

CE 3 Hydromechanics. (Prerequisite: M 11). Hydrostatics; flow of water through orifices and tubes; flow in pipes, conduits, and natural channels; hydraulic machinery; pneumatics. Recitations and lectures. Required of Seniors in Civil Engineering.

PROFESSOR CULLIMORE *Eight credit hours*

CE 4 Mechanics of Materials. (Prerequisites: M 7 and 11; Ps 3 and 4; CE 3 and 2). Theory of elasticity; simple stresses; strength of pipes and riveted joints; strength and stiffness of beams and of columns and shafts; resilence of materials. Investigation and design. Properties and structural forms of iron and steel. Recitations, lectures, and laboratory. Required of Seniors in Engineering except in Chemical Engineering.

PROFESSOR SHORT *Eight credit hours*

CE 5 Railroad Economics. Organization, capitalization, operation, maintenance, etc. A study of economic principles as applied to transportation problems. Elective for Seniors in Civil Engineering. Second term.

Two credit hours

CE 6 Building Construction. (Prerequisites: Ps 3 and 4). Materials and their use in construction of buildings. Required of Juniors in Engineering except in Chemical Engineering. First term.

PROFESSOR CULLIMORE *Three credit hours*

CE 7 Economics. The principles of economics as applied to elementary problems in business and accounting. Recitations and lectures. Required of Seniors in Civil Engineering. First term.

Three credit hours

CE 8 Highways. (Prerequisite: CE 15). Location, construction, and maintenance of roads, streets, and pavements, including study of tractive forces and of the properties of road materials. Recitations and lectures. Optional with Seniors in Civil Engineering.

PROFESSOR SHORT *Eight credit hours*

CE 9 Railroads. (Prerequisites: M 2; CE 15 and 16). Reconnaissance, preliminary and location surveys, structures; track-work, maintenance, operation; economic theory of location. Recitations and office-work. Optional with Seniors in Civil Engineering.

PROFESSOR CULLIMORE *Eight credit hours*

CE 10 Water Supply. Requisites of a supply; source; construction and maintenance of systems for collecting, storing, purifying, and distributing water. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering. Second term.

PROFESSOR SHORT *Four credit hours*

CE 11 Sewerage. Different systems for the removal of sewage; design, construction, and maintenance of sewers; individual sewers; sewer appurtenances; disposal and utilization of sewage. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering. First term.

PROFESSOR SHORT *Five credit hours*

CE 12 Structures. The design of steel and masonry structures. Lectures and recitations. Optional with Seniors in Civil Engineering. First term.

PROFESSOR CULLIMORE *Five credit hours*

CE 13 Framed Structures. (Prerequisites: M 7 and 11; CE 32). Lectures on the construction of the common type of trusses; stresses in the common forms of roof and bridge trusses by algebraic methods; elementary problems in investigation. Required of Juniors in Civil Engineering. Second term.

PROFESSOR CULLIMORE *Three credit hours*

CE 15 Surveying. (Prerequisite: CE 34). Principles; problems; use of chain, compass, level, and transit; theory of constructoin and use of instruments; land surveying with transit; survey of public lands of the United States; topographical surveying; city, hydrographic, and mine surveying; functions of the surveyor; princpiles for guidance in original surveys and resurveys; adjustment of observations by method of least squares; theory of construction and use of barometer; plotting and computations from students 'own field-notes, involving use of various office instruments. Recitations, lectures, field-work, and office-work. Required of Sophomores in Civil Engineering. Four hours.

ASSISTANT PROFESSOR PRESTON *Six credit hours*

CE 16 Surveying. (Prerequisite: CE 15). Circular curves; complete topographical survey of a tract of land and location of an industrial spur track; mapping; mathematical astronomy for field use; determination of latitude, azimuth, time, and longitude; use of sextant and solar transit,—day and night observations. Recitations, lectures, field-work, and office-work. Required of Juniors in Civil Engineering.

ASSISTANT PROFESSOR PRESTON *First term, three and a half credit hours; second term, five and a half credit hours*

CE 31 Structural Design. The detailed design and making of shop drawings for steel structures. Optional with Seniors in Civil Engineering. Second term.

PROFESSOR CULLIMORE *Four credit hours*

CE 32 Graphic Statics. (Prerequisite: M 2). Coplanar forces, concurrent and non-concurrent; friction; center of gravity; moment of inertia; simple trusses; problems. Recitations, lectures, and drawing. Required of Juniors in Engineering except in Chemical Engineering. Two hours a week.

ASSISTANT PROFESSOR PRESTON *Two credit hours*

CE 33 Engineering Laboratory. Study of construction and use of testing apparatus, including testing machines and attachments; examinations and tests of structural materials; discussion of results; preparation of reports. Required of Seniors in Civil Engineering. Three hours. First term.

ASSISTANT PROFESSOR PRESTON *One and a half credit hours*

CE 34 Surveying. Study of the compass, transit, and level, their uses and adjustments; use of chain in land surveys; computations in land surveys. Recitations and field work. Required of Freshmen in Engineering except in Chemical Engineering. Two hours.

ASSISTANT PROFESSOR PRESTON *Two credit hours*

CE 37 Hydraulic Design. A course in the drafting-room to accompany CE 10. The design of water-supply and sewage-disposal works. Optional with Seniors in Civil Engineering. Second term. Five hours.

PROFESSOR SHORT *Two and a half credit hours*

CE 38 Highway Design. A course in the drafting-room and laboratory to accompany CE 8. The design and location of highways. Optional with Seniors in Civil Engineering. Second term. Five hours.

PROFESSOR SHORT *Two and a half credit hours*

CE 39 Railroad Design. A course in the drafting room to accompany CE 9. The design of yards and structures in connection with the location of a railroad line. Optional with Seniors in Civil Engineering. Second term. Five hours.

PROFESSOR CULLIMORE *Two and a half credit hours*

DAIRYING

The dairy interests of Delaware are not large, and are confined principally to the production of milk for the city markets. The courses of instruction in this subject are planned to acquaint the students with the whole field, and after the year 1915-1916 facilities will be provided for practical courses in butter, cheese, and ice cream-making

as well as in the production and preparation of milk for direct consumption.

Studies will also be made of the local commercial milk plant and of some of the large centralized plants of adjoining cities.

D 1 The work in dairying consists of a study of the production, care, and sale of high class market milk, farm dairy butter, and dairy inspection. A practice course in milk testing, separating, etc., will be required of each student. Observation trips will be made to some of the certified milk dairies and large market milk establishments in the vicinity of Philadelphia. One lecture and four laboratory hours a week. Second term.

ASSISTANT PROFESSOR GRIMES *Three credit hours*

ELECTRICAL ENGINEERING

PROFESSOR KOERBER AND MR. ————

EE 1 Direct Currents. Theory of the direct current dynamo; shunt, series, and compound wound field magnets; ring and drum windings; commutators; direct current motors. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. First term.

MR. ———— *Two credit hours*

EE 2 Direct Currents. Operation, regulation, and methods of testing dynamos and motors. Study of motor and dynamo characteristics. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. Second term.

MR. ———— *Two credit hours*

EE 3 Alternating Currents. Inductance and capacity; harmonic electromotive force; single phase and polyphase circuits; alternating current instruments and machinery. Theory of single phase and polyphase induction motors; induction generators; synchronous motors and converters; and single phase commutator motors

Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR KOERBER *Eight credit hours*

EE 5 Electrical Engineering Seminary. Papers on assigned topics; lectures on recent advances in electrical engineering; discussion of thesis work; discussion of articles in current engineering periodicals. Required of Seniors in Electrical Engineering.

PROFESSOR KOERBER *Two credit hours*

EE 8 Telephones and Telegraphs. A study of modern telephone systems with a review of the earlier systems and developments. Required of Seniors in Electrical Engineering.

MR.———— *Two credit hours*

EE 9 Electricity and Magnetism. Fundamental principles of electricity and magnetism. Required of all Sophomores in Engineering. Second term.

MR.———— *Two credit hours*

EE 10 Direct Currents. Direct current distribution; calculation of high and low tension lines; electric lamps and photometry; details of outside wiring, with particular reference to the rules and regulations of the National Board of Fire Underwriters. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR KOERBER *Two credit hours*

EE 11 Direct Currents. Theory and application of electrical machinery. Required of Juniors in Civil Engineering. First term.

MR.———— *Two credit hours*

EE 20 Electrical Design. The calculation, design, and construction of direct and alternating current machinery. Required of Seniors in Electrical Engineering. Six hours a week.

PROFESSOR KOERBER *Six credit hours*

EE 30 Electrical Laboratory. Determination of characteristic curves; efficiencies and magnetic elakage of direct current dynamos and motors; life and efficiency tests of arc and incandescent lamps. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

PROFESSOR KOERBER *Three credit hours*

EE 31 Electrical Laboratory. Efficiencies and characteristic curves of alterators, synchronous motors, induction motors, and transformers. Required of Seniors in Electrical Engineering. Six hours a week.

PROFESSOR KOERBER *Six credit hours*

EE 32 Electrical Laboratory. Testing of alternating current machinery and apparatus. Required of Seniors in Mechanical Engineering. Three hours a week.

MR. ———— *Three credit hours*

ENGLISH

PROFESSOR SYPHERD, ASSISTANT PROFESSOR DUTTON, AND MR. POHL

The courses in the Department of English are designed (1) to enable every student at graduation to express his ideas, orally or in writing, in accurate, clear, effective English; and (2) to give to students through required and elective work an acquaintance with the best authors in English and American Literature and an appreciation of good poetry and prose. All Freshmen are required to take Composition, which involves training in oral and written expression; all Sophomores, a general course in Literature, which treats writers, types, and movements. Seniors in Arts and Science and in Engineering are required to take an additional course in English

E 1 Composition. Oral and written. An elementary course which lays especial stress on accuracy and clearness in expression. Recitations, oral and written exercises, conferences, and outside readings. Required of al Freshmen.

PROFESSOR SYPHERD, ASSISTANT PROFESSOR DUTTON, AND MR POHL *Six credit hour*

E 2 Literature. Introductory Course. A brief summary of the history of the English Language and a rapid survey of the whole field of English Literature, accompanying a more detailed and thorough study of the main literary forms—narrative and lyric poetry, the drama, prose fiction, and the essay. Discussions, lectures, outside readings, reports, and conferences. Required of Sophomores in Agriculture and Engineering.

ASSISTANT PROFESSOR DUTTON AND MR. POHL *Four credit hours*

E 2a Literature. Introductory Course. An expansion of Course 2. Required of Sophomores in Arts and Science.

ASSISTANT PROFESSOR DUTTON AND MR. POHL *Six credit hours*

E 3 Literature. Nineteenth Century. The Novel. A study of the art of the novel based on a careful analysis of one representative novel and an extensive reading among the novelists of the century. Elective for Juniors and Seniors, and, with the consent of the instructor, for Sophomores. First term.

Three credit hours

E 4 Literature. Nineteenth Century. Poetry. Studies in the poetry of Robert Browning, accompanied by outside reading of other poets of the Victorian Age. Elective for Juniors and Seniors, and, with the consent of the instructor, for Sophomores. Second term.

Three credit hours

E 5 Literature. Chaucer. A critical and appreciative study of some of the Canterbury Tales and of other poems of Chaucer. Elective for Juniors and Seniors. First term.

PROFESSOR SYPHERD *Three credit hours*

E 6 American Literature. The aim of this course is to make a general study of the most important works of American writers from the period of the Revolution down to the present time, and a critical study of a few of the best known works of Irving, Hawthorne, Poe, and others.

A careful study of the connection between the literature and the life of the time is also made. Considerable outside reading is required and more suggested, and memory passages are assigned. Lectures, recitations, and reports. Elective for Sophomores and Juniors. [Omitted in 1917-1918].

ASSISTANT PROFESSOR DUTTON *Six credit hours*

E 7 Composition. Technical English for Engineers. In this course, students have practice in the writing of business letters, reports, instructions, orders, specifications and contracts, and general engineering papers. Required of Seniors in Engineering.

PROFESSOR SYPHERD *Two credit hours*

E 8 Composition. An advanced course in writing open to Sophomores and Juniors. This course is designed for students who desire further practice in narrative, descriptive, and expository writing. Themes, outside reading, and conferences. First term.

MR. POHL *Three credit hours*

E 9 Composition and Literature. A study of the English essay, with abundant exercises in expository writing, first term; a study of the short story in English, with exercises in narrative writing, second term. Required of Seniors in Arts and Science.

PROFESSOR SYPHERD *Six credit hours*

E 10 Composition. This course is designed to give students in Agriculture training in the planning and phrasing of such papers as they will be called upon to write in connection with the practice of their profession. Elective for Juniors and Seniors in Agriculture.

ASSISTANT PROFESSOR DUTTON *Two credit hours*

E 11 Literature. Modern drama. Rapid survey of English drama from Shakspere to the nineteenth century. Influence of the French school and Ibsen. Intensive study of Jones, Shaw, Pinero, etc. Outside readings, discussions, lectures, and practice in dramatic writing. Elective

for Juniors and Seniors in Arts and Science. [Omitted in 1917-1918].

MR. POHL *Six credit hours*

E 12 Literature. Anglo-Saxon. Elementary course. Elective for Seniors in Arts and Science. Second term.

Two credit hours

E 13 Teachers' Course. The teaching of English in the schools. Open to teachers and to Seniors.

Saturday, 9.00-11.00 *Four credit hours*

E 14 Debating. Elective for all students but Freshmen.

ASSISTANT PROFESSOR DUTTON *Two credit hours*

E 15 Literature. Shakspere. A critical study of one of Shakspere's plays, accompanied by a rapid reading of several other plays. Second term.

Three credit hours

E 16 Literature. A literary study of the Bible. Second term.

PROFESSOR SYPHERD *Three credit hours*

HISTORY AND ECONOMICS

PROFESSOR VAUGHN, ASSISTANT PROFESSOR GREENFIELD, AND PROFESSOR COUNTS

The courses in this Department are arranged in the approximate order in which they should be taken by the student. In the first two years certain courses are required; all other courses are elective. Sophomores may, with permission of the Department, elect courses 4, 5, 6, 7, or 8 in addition to the required work. Course 4 will be given in alternate years with courses 14 and 15. In all work as outlined an attempt is made not only to afford general information and culture but also to give practical training in citizenship. It is believed that these courses are essential to those who are looking forward to a career in one of the professions.

H 1 European History. An introductory course dealing with the history of Western Europe during the mediaeval and modern periods, with special reference to the leading institutions, significant events, and dominant personalities of the successive epochs. Required of Freshmen in Arts and Science.

ASSISTANT PROFESSOR GREENFIELD *Six credit hours*

H 2 History and Government of Delaware. The aim of this course is to give a general view of the history of Delaware as colony and state, and also to outline the main features of its government. Required of Freshmen in Engineering and Agriculture. First term.

PROFESSOR VAUGHN *One credit hour*

H 3 History of the United States. A somewhat advanced course in American history, embracing the Colonial and Revolutionary periods, early national development, slavery and westward expansion, the Civil War and Reconstruction, and recent developments. A portion of the time will be given to Delaware history in relation to these movements. Required of Sophomores in Arts and Science.

PROFESSOR VAUGHN *Six credit hours*

H 4 History of England. A general study of the development of the English people—political, social, institutional, and literary—from the earliest times to the present day. Such topics as economic history, the rise of democracy, and the growth of empire call for special emphasis. Source readings and reports. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Six credit hours*

H 5 French Revolution and Napoleonic Era. France on the eve of the French Revolution, the political philosophers of the eighteenth century, the causes and the significant events of the Revolution, and the wars of Napoleon. Elective for Juniors and Seniors in Arts and Science, and required of Seniors in Agriculture. First term.

PRESIDENT MITCHELL *Three credit hours*

H 6 Europe since 1815. A study of political and social life,—the revolution in France, the founding of Germany and Italy, the development of the British Empire, Turkey and the Eastern Question, and modern democracy and material progress,—as a background for the understanding of existing conditions in Europe. Elective for Juniors and Seniors in Arts and Science and required of Seniors in Agriculture. Second term.

PRESIDENT MITCHELL *Three credit hours*

H 7 Introduction to the Study of Society. This course treats of the origins of society and of our present social institutions, and aims to give the student a working knowledge of society and social phenomena. Elective for Juniors and Seniors. First term.

PROFESSOR COUNTS *Three credit hours*

H 8 Practical Sociology. A study of present day society with special reference to certain of the more important social problems. Such topics as the following will receive particular attention: the family, the rural community, the modern city, the conflict of classes, distribution of wealth, population, immigration, the negro, social treatment of crime, and eugenics. Elective for Juniors and Seniors. Second term.

PROFESSOR COUNTS *Three credit hours*

H 9 Rural Sociology. A course in sociology with special reference to the conditions and problems of rural life. Required of Seniors in Agriculture. Second term.

PROFESSOR COUNTS *Three credit hours*

H 10 Principles of Economics. The purpose of the course is to give the student a knowledge of the fundamental principles of economic science and to furnish a basis for the study of present-day problems. Readings and reports. Elective for Juniors and Seniors. First term.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 11 Economic Problems. The following problems will be considered as thoroughly as time permits: (1) Money, credit, and banking, (2) the tariff, (3) labor problems, (4) monopolies and trusts, (5) socialism, and (6) taxation. Outside reading and reports. Elective for Juniors and Seniors. Second term.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 12 Agricultural Economics. A general course in economic principles and problems, with special reference to agriculture. Required of Seniors in Agriculture. First term.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 13 American Government. A general course dealing with the structure and work of the American government, national, state, and local. Stress is laid upon contitutional questions and judicial decisions and upon practical problems. Outside reading and occasional reports. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Six credit hours*

H 14 Political Parties and Practical Politics. A study of American party history and of the development and operations of party machinery; problems in practical politics; the relation of party problems to governmental efficiency and political morality. Reading and reports. Elective for Juniors and Seniors. First term.

PROFESSOR VAUGHN *Three credit hours*

H 15 The United States as a World Power. The United States in relation to world politics. Questions of nationality and race; political ideals and shibboleths; the Monroe Doctrine; the Spanish War and the acquisition of colonies; relations with France, Germany, Russia, England; the Isthmian Canal; Latin America; the United States in the Pacific, and relations with China and Japan. Elective for Juniors and Seniors. Second term.

PROFESSOR VAUGHN *Three credit hours*

H 16 Studies in Delaware History. An advanced course which offers opportunity to develop special topics in the social, economic, and political history of the state. The aim is partly information and partly training in research work. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Four or six credit hours*

H 17 Research Course. A special course in methods of reading and research work. The student may select his topic for investigation from any of the fields of work outlined above. Elective for Seniors.

PROFESSOR VAUGHN *Six credit hours*

HORTICULTURE

PROFESSOR MCCUE AND ASSISTANT PROFESSOR PAILTHORP

Courses 1, 3, and 14 are required of all students in Agriculture. Course 14 is elective for Arts and Science students who can furnish the proper prerequisites.

A student specializing in Horticulture will be expected to take practically all of the courses offered by the Department. Students majoring in Horticulture are urged to take course 3 in Biology and course 1 in Plant Pathology.

The college is very fortunately located for the study of Horticulture. The fruit and vegetable growing centers of the State are easily accessible. Many famous fruit and truck growing districst in neighboring states are distant but a few hours' ride. The cold storage houses and the large markets of Philadelphia can be reached in an hour's time, and a famous greenhouse district of Pennsylvania lies only a few miles to the north of Newark. The earnest student will have many opportunities to see the practical growing, harvesting, and marketing of horticultural crops.

The Experiment Station possesses about forty acres of orchards and gardens, that can, to a limited extent, be used for purposes of instruction. All the tree, bush, and vine fruits that can be grown in the State are found in the college orchards. About an acre of land is also available

for the use of students in vegetable gardening. A small greenhouse is available for instructional purposes.

Hort 1 Plant Propagation. (Prerequisite: B 4). A discussion of the principles governing the propagation of plants by seeds, buds, grafts, layers, and cuttings. Required of all Sophomores in Agriculture. First term. Four hours.

ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 2 Vegetable Gardening. (Prerequisite: Hort 1) A study of the location of vegetable gardens and truck farms. Soil, cultural, and fertilizer requirements of the principal trucking crops. A study of the construction and management of hot beds and cold frames. Each student is required to plan, plant, and cultivate a small garden. Trips of inspection are required. Elective for students in Agriculture. Second term. Four hours.

ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 3 Pomology. (Prerequisite: Hort 1) A general course in fruit growing designed to meet the needs of those students who do not wish a detailed technical course in orcharding. Required of all Juniors in Agriculture. First term. Four hours.

ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 4 Pomology. (Prerequisite: Hort 3) Commercial Pomology. A course designed to deal with the details of fruit production, both from the practical and scientific standpoints. Special emphasis is placed upon spraying. Second term. Four hours.

ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 5 Forestry. (Prerequisite: B 4). A brief introductory course in Forestry. The course embraces a discussion of the handling of wood lots, care and protection of the forests, forest mensuration, and studies of the forest trees of the U. S. Elective for Juniors and Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Two credit hours*

Hort 6 Landscape Gardening. (Prerequisites: B 4; Hort 1). This course gives a discussion of the laws of ornamental gardening, planning and making lawns, grouping of trees and shrubbery, and the comparisons between the formal and naturalistic styles of gardening. Elective for Juniors and Seniors in Agriculture. Second term.

ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 7 Advanced Pomology. (Prerequisites: B 4; Hort 1, 3, and 4). A continuation of course 4. Elective for Seniors in Agriculture. First term.

PROFESSOR MCCUE *Three credit hours*

Hort 8 Breeding of Horticultural Plants. (Prerequisites: Hort 1, 2, 3, 4, and 14). A study of the application of the laws of heredity to economic horticulture Elective for Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Three credit hours*

Hort 9 Forcing Crops. (Prerequisites: Hort 1 and 2; B 3, 4, and 5). A study of greenhouse crops, both vegetable and floral, and greenhouse construction. Elective for Seniors in Agriculture. Second term.

PROFESSOR MCCUE AND ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 10 Small Fruits. (Prerequisites: Hort 1 and 3). A discussion of the commercial production of strawberries, raspberries, gooseberries, and currants. Elective for Juniors and Seniors in Agriculture. Second term.

PROFESSOR MCCUE *Two credit hours*

Hort 11 Systematic Pomology. (Prerequisites: Hort 3 and 4). A study of the systematic relationship of the cultivated fruits of the United States. Identification, description, and judging of the common commercial varieties of apples, pears, plums, grapes, and peaches grown in America. Elective for Seniors in Agriculture. First term.

PROFESSOR MCCUE AND ASSISTANT PROFESSOR PAILTHORP *Three credit hours*

Hort 12 Horticultural Seminar. A study of the literature of horticulture, both past and present, and current events of horticultural interest. Required of all Senior students majoring in Horticulture. First term. Two hours.

PROFESSOR MCCUE AND ASSISTANT PROFESSOR PAILTHORP
One credit hour

Hort 13 Horticultural Seminar. A continuation of Hort 12. Required of all Senior students majoring in Horticulture. Second term. Two hours.

PROFESSOR MCCUE AND ASSISTANT PROFESSOR PAILTHORP
One credit hour

Hort 14 Genetics. (Prerequisites: B 1 and 4) A brief course discussing the foundation principles and the various theories of heredity. Required of Seniors in Agriculture and elective for Juniors and Seniors in Arts and Science. First term.

PROFESSOR MCCUE *Three credit hours*

Hort 15 Thesis. Individual investigational work upon some phase of Horticulture. Assignments by consultation. Elective for students in Agriculture majoring in Horticulture.

PROFESSOR MCCUE *Three credit hours*

MATHEMATICS

PROFESSOR HARTER, PROFESSOR SHORT, ASSISTANT PROFESSOR PRESTON, ASSISTANT PROFESSOR MCAVOY, AND DR. RAWLINS

Four hours a week of pure Mathematics are required in all courses in the Freshman year, except in the course in Agriculture, where Mathematics is discontinued at the end of the first term.

Occasional lectures are given to show the interdependence of the various branches of Mathematics, to illustrate the laws expressed in the formulas, and to impress upon the mind of the student the beauty as well as the usefulness of Mathematics.

A student will not be permitted to enter a course in Mathematics unless those subjects marked prerequisite have been passed.

M 1 Solid Geometry. Required of Freshmen in Arts and Science and Agriculture. First term.
ASSISTANT PROFESSOR MCAVOY *Two credit hours*

M 2 Plane Trigonometry. Required of Freshmen in Arts and Science, and Agriculture. First term.
DR. RAWLINS *Two credit hours*

M 3 Spherical Trigonometry. Required of Freshmen in Arts and Science. Second term.
DR. RAWLINS *One credit hour*

M 4 College Algebra, including review of elements. Required of Freshmen in Arts and Science. Second term.
DR. RAWLINS *Three credit hours*

M 6 Analytical Geometry. (Prerequisites: M 16, M 17 or M 2, M 3, M 4). Required of Sophomores in Engineering. Elective for others. Plane: First term. Solid: First two weeks of second term.
DR. RAWLINS *Four credit hours*

M 7 Differential and Integral Calculus. Fundamental principles and applications. Required of Sophomores in Engineering. Elective for others.
DR. RAWLINS *Four credit hours*

M 8 Differential and Integral Calculus; Differential Equations. (Prerequisites, M. 6, M. 7). Required of Juniors in Civil, Mechanical, Electrical, and Chemical Engineering courses. Open for election to all other qualified students.
PROFESSOR HARTER *Six credit hours*

M 9 General Astronomy.
PROFESSOR HARTER *Four credit hours*

M 11 Theoretical Mechanics. (Prerequisite: M 7).
PROFESSOR SHORT *Ten credit hours*

M 12, 13 Theory of Functions.
PROFESSOR HARTER *Four credit hours*

M 14 Method of Least Squares. (Prerequisite: M 7). First term.

PROFESSOR HARTER *Two credit hours*

M 15 Quaternions. (Prerequisite: M 7). Second term.

PROFESSOR HARTER *Two credit hours*

M 16 Plane Trigonometry and Elements of Algebra. Required of Freshmen in Engineering. First term.

ASSISTANT PROFESSOR PRESTON *Four credit hours*

M 17 Spherical Trigonometry and College Algebra. Required of Freshmen in Engineering. Second term.

ASSISTANT PROFESSOR PRESTON *Four credit hours*

MECHANICAL ENGINEERING

PROFESSOR M. VAN G. SMITH, ASSISTANT PROFESSOR SRAGER, AND ASSISTANT PROFESSOR BELDING

ME 1 Elements of Steam Engineering. A general description of engines and boilers; their fundamental principles; detailed description of their parts; the reasons for using various elements of construction; practice in the use of an engineering vocabulary; freehand sketches of various parts of engines and boilers; problems. Required of all Juniors in Engineering. Second term.

ASSISTANT PROFESSOR BELDING *Three credit hours*

ME 3 Thermodynamics. The fundamental laws of the mechanical theory of heat, and their application to gases, saturated and superheated vapors; the theory of steam, air, and gas engines, and refrigeration machines. Required of Seniors in Mechanical Engineering.

PROFESSOR SMITH *Four credit hours*

ME 4 Steam Engines and Boilers. The principles, theory, and construction of the steam engine. The fundamental principles of steam turbines. Power plant auxiliaries. Steam boilers; their principles, design, and con-

struction. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR SMITH *Eight credit hours*

ME 6 Gas Engines. The theory and principles of the gas engine; its construction and operation; gas producers. Required of Seniors in Mechanical and Electrical Engineering.

PROFESSOR SMITH *Two credit hours*

ME 9 Steam Turbines. A further consideration of their theory and construction. A continuation of ME 4. Required of Seniors in Mechanical Engineering.

PROFESSOR SMITH *Two credit hours*

ME 20 Descriptive Geometry. The solution of problems relating to points, lines, planes, and surfaces, with practical applications. Recitations and drawing. Required of all Freshmen in Engineering.

ASSISTANT PROFESSORS SRAGER AND BELDING *Four credit hours*

ME 21 Mechanical Drawing. The care and use of instruments and materials; outlining; principles of outline shading; section lining; projections; lettering; intersection and development of surfaces. Required of all Freshmen in Engineering. Three hours a week.

ASSISTANT PROFESSORS SRAGER AND BELDING *Three credit hours*

ME 22 Mechanical Drawing. Free hand sketching; detailed working drawings and assembly drawings; tracing; blue printing; use of handbooks. Required of all Sophomores in Engineering. Three hours a week.

ASSISTANT PROFESSOR SRAGER *Three credit hours*

ME 23 Mechanical Drawing. Extension of course ME 22; drawing from empirical formulas; methods of laying out cams, gear wheels, and other mechanical contrivances. Required of Sophomores in Mechanical and Electrical and Chemical Engineering. Second term. Three hours a week.

ASSISTANT PROFESSOR SRAGER *One and a half credit hours*

ME 24 Kinematics. The laws of motion; combinations of pure mechanism; rolling and sliding contact; velocity diagrams; linkwork; cams; pulleys; forms of gear teeth. The general theory of slide valve and link motions. The application of the Zeuner diagram to the design of the principal slide-valve gears. Classroom work and drafting. Required of Juniors in Mechanical and Electrical Engineering.

ASSISTANT PROFESSOR SRAGER *Eight credit hours*

ME 25 Machine Design. The principles of the design of machinery; their application to the design of special parts, comprising the calculation of all stresses and the necessary distribution of metal to withstand them; properties and uses of materials; the use of handbooks. Classroom work, lectures, and drafting. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH *Six credit hours*

ME 30 Experimental Engineering. The methods of measuring power; standardization and calibration of instruments; brake and dynamometer tests; efficiency tests of engines, boilers, steam pumps, blowers, and condensers; calorific value of fuels; tests of the common constructive materials. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH AND ASSISTANT PROFESSOR BELDING *Six credit hours*

ME 31 Experimental Engineering. A course similar to ME 30. Required of Seniors in Electrical Engineering. Three hours a week.

PROFESSOR SMITH AND ASSISTANT PROFESSOR BELDING *Three credit hours*

ME 40 Carpentry and Wood Turning. The care and general use of wood-working tools; exercises in carpentry; exercises in wood-turning; practical instruction in firing steam boilers and the operation of steam engines. Required of all Freshmen in Engineering. Three hours a week.

MR. STRING *Three credit hours*

ME 41 Metal Work and Forging. Exercises in metal turning, facing, boring, planing, drilling, thread cutting, and milling; the use of metal-working hand tools, chipping, and filing; forging and tool dressing; the construction of machine parts, finishing, and assembling; management of steam engines and boilers. Required of Sophomores in Mechanical and Electrical Engineering. Three hours a week.

MR. STRING *Three credit hours*

ME 42 Pattern Making and Founding. The principles of making simple patterns, core-boxes, and patterns for machine parts; core-making; dry sand moulding and casting. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

MR. STRING *Three credit hours*

ME 43 Supplementary Term in Shopwork. The work done during this term is the same as that described under ME 41. The term begins the day after Commencement each year and lasts two weeks. The hours for work are from 8.15 a. m. to 4.05 p. m. Required of Sophomores in Mechanical, Electrical, and Chemical Engineering.

MR. STRING *Three credit hours*

ME 44 Metal Working and Forging. A course similar to ME 41. Required of Sophomores in Chemical Engineering. First term. Three hours a week.

MR. STRING *One and a half credit hours*

MILITARY SCIENCE AND TACTICS

W. F. HOEY, JR., *First Lieutenant, U. S. Infantry*

Beginning with the year 1917-1918, there will be established an Infantry Unit of the Reserve Officers Training Corps, which was provided for in the National Defense Act of June 3, 1916.

The primary object of this Corps is to qualify students of Civil Educational Institutions for Reserve Officers, by systematic and standard methods of training.

The system of instruction prescribed presents a standardized measure of that military training whcih is necessary in order to prepare the students to perform intelligently the duties of commissioned officers in the military forces of the United States.

The complete course covers four years of training; the last two years, however, will be elective so far as the War Department is concerned. A student electing to take the two years advanced course will have to be recommended to the War Department by the President of the College and the Professor of Military Science and Tactics. The student will then be required to sign an agreement in writing, to continue in the corps during the remainder of his course in College, to devote five hours per week to the training prescribed, and to attend two Summer Training Camps of four weeks each. (Should he have attended any training camps during his Freshman and Sophomore years, he will be given credit for same). In return for this the Government agrees to furnish to such student, Commutation of Subsistence, amounting to some Seven or Eight Dollars per month, during the remainder of his course, and to pay all expenses incident to his attendance at the training camps.

All graduates of the four year course will be eligible for appointment in the Reserve Officers Corps, thereby being practically assured of being able to serve as commissioned officers in the forces of the United States in time of war.

They will also be eligible for appointment as Temporary Second Lieutenants in the Regular Army, which would entitle them to six months training with the Regular Army with the allowance of a Second Lieutenant (quarters, light, fuel, etc.) and a salary of One Hundred Dollars per month. This special training with the Regular Army would probably enable them to increase their rank in the Reserve Officers Corps.

All graduates of the institution may be given an opportunity by the War Department to take the Competitive Examination for Commissions as Second Lieutenants in the Regular Army, and in such cases they would be exempted from examination in the following subjects:

1 United States History and Constitution
2 Geography
3 Elementary English
4 Algebra
5 Geometry
6 Trigonometry

Graduates are also in demand as officers in the Organization of Native Troops in the Philippine Islands.

The work in the Reserve Officers Training Corps having been entered upon by the Student, it will be a prerequisite for graduation for such student.

All Text-books, Manuals, and Maps will have to be purchased by the student in the same manner that other text-books are obtained.

The Law authorizing the Reserve Officers Training Corps provides that the War Department shall furnish Uniforms, Arms, Ammunition, and Equipment for each member of the Unit.

COURSE OF TRAINING FOR INFANTRY UNITS OF THE SENIOR DIVISION

FRESHMAN YEAR

1 Military art

Three hours a week (counting 14 units)

(*a*) Practical. Weight 10.
Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include the School of the Soldier, Squad and Company, close and extended order. Preliminary instruction sighting position and aiming drills, gallery practice, nomenclature and care of rifle and equipment.

(*b*) Theoretical. Weight 4.

Theory of target practice, individual and collective (use of landscape targets made up by U. S. Military Disciplinary Barracks, Fort Leavenworth, Kans.); military organization (Tables of Organization); map reading; service of security; personal hygiene.

2 Military art

Three hours a week (counting 14 units)

(*a*) Practical. Weight 10.

Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include School of Battalion, special attention devoted to fire direction and control; ceremonies; manuals (Part V, Infantry Drill Regulations); bayonet combat; intrenchments (584-595, Infantry Drill Regulations); first-aid instruction; range and gallery practice.

(*b*) Theoretical. Weight 4.

Lectures, general military policy as shown by military history of United States and military obligations of citizenship; service of information; combat (to be illustrated by small tactical exercises); United States Infantry Drill Regulations, to include School of Company; camp sanitation of small commands.

SOPHOMORE YEAR

3 Military art

Three hours a week (counting 14 units)

(*a*) Practical. Weight 10.

The same as course 2 (*a*). Combat firing, if practicable, but collective firing should be attempted in indoor ranges by devices now in vogue at United States Disciplinary Barracks.

(*b*) Theoretical. Weight 4.

United States Infantry Drill Regulations, to include School of Battalion and Combat (350-622); Small-Arms Firing Regulations; lectures as in (*b*) course 2; map reading; camp sanitation and camping expedients.

4 Military art

Three hours a week (counting 14 units)

(*a*) Practical. Weight 10.

The same as course 2 (*a*); signaling; semaphore and flag; first-aid. Work with sand table by constructing to scale

intrenchments, field works, obstacles, bridges, etc. Comparison of ground forms (constructed to scale) with terrain as reqresented on map; range practice.

(*b*) Theoretical. Weight 4.

Lectures, military history (recent); service of information and security (illustrated by small tactical problems in patrolling, advance guards, rear guards, flank guards, trench and mine warfare, orders, messages, and camping expedients); marches and camps (Field Service Regulations and Infantry Drill Regulations).

JUNIOR YEAR

5 Military art

Five hours a week (counting 24 units)

(*a*) Practical. Weight 13.

Duties consistent with rank as cadet officers or noncommissioned officers in connection with the practical work and exercises laid down for the unit or units. Military sketching.

(*b*) Theoretical. Weight 11.

Minor tactics; field orders (studies in minor tactics, United States School of the Line); map maneuvers. Weight 8.

Company administration, general principles (papers and returns). Weight 1.

Military history. Weight 2.

6 Military art

Five hours a week (counting 24 units)

(*a*) Practical. Weight 13.

Same as (*a*) course 5. Military sketching.

(*b*) Theoretical. Weight 11.

Minor tactics (countinued); map maneuvers. Weight 8.

Elements of international law. Weight 2.

Property accountability; method of obtaining supplies and equipment (Army Regulations). Weight 1.

SENIOR YEAR

7 Military art

Five hours a week (counting 24 units)

(*a*) Practical. Weight 13.

Duties consistent with rank as cadet officers or noncommissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching.

(*b*) Theoretical. Weight 11.
Tactical problems, small forces, all arms combined; map maneuvers; court-martial proceedings (Manual for ourts-martial).
International relations of America from discovery to present day; gradual growth of principles of international law embodied in American diplomacy, legislation, and treaties.
Lectures: Psychology of war and kindred subjects.
General principles of strategy only, planned to show the intimate relationship between the statesman and the soldier (not to exceed 5 lectures).

8 Military art
Five hours a week (counting 24 units)
(*a*) Practical. Weight 13.
Same as course 7 (*a*).
(*b*) Theoretical. Weight 11.
Tactical problems (continued); map maneuvers. Rifle in war.
Lectures on military history and policy.

It is presumed that each member of the Reserve Officers' Training Corps during his academic course has taken one course or equivalent credit in either French, or German, or Spanish.

MINERALOGY AND GEOLOGY

PROFESSOR PENNY AND ASSISTANT PROFESSOR TIFFANY

Mineralogy is taught by means of recitations and lectures, followed by laboratory work on the determination of the different species of minerals. The course is three hours for one term.

Geology is taught by means of recitation and lectures. The course is three hours for one term.

Mi 1 Mineralogy. This course treats of the physical, morphological, and chemical properties of minerals and especially of the occurrence and recovery of the useful minerals. Recitations and laboratory practice. First term.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

Mi 2 Geology. This course treats of dynamical, structural, and historical geology. Recitations and lectures. Second term.

ASSISTANT PROFESSOR TIFFANY *Three credit hours*

MODERN LANGUAGES AND LITERATURES

PROFESSOR E. L. SMITH, MR. SPIKER, AND MR. BERNHARDT

French and German are among the required subjects of study, and Spanish and Italian are offered to those who wish to elect them. With the approval of the Faculty any year or years of this work may be elected by a student in addition to the amount required in his course.

The aim of the courses offered in Modern Languages is to provide elementary and intermediate instruction in German, French, Spanish, and Italian. Students who have completed commendably the courses offered in these languages may expect to possess a good pronunciation, an accurate reading knowledge of the language, and an acquaintance with the more important modern authors and some familiarity with the more important literary groups and movements. The scientific and commercial aspects of the languages receive due attention but without overlooking the more important cultural values. An effort is made to acquaint the student with the several European civilizations from the linguistic and literary point of view, and to inspire in him such a love for these languages and literatures as will be a source of pleasure and intellectual growth.

FRENCH

ML 1 French Elements. Stress is laid on accurate pronunciation. Practice in the use of phonetic symbols. The essentials of grammar including the irregular verbs. Reading of easy modern French prose. Oral and written exercises. Dictation. Olmstead's Elementary French Grammar. Gueber, Contes et Légendes, Première Parti. Labiche et Martin, Le Voyage de Monsieur Perrichon.

PROFESSOR SMITH AND MR. SPIKER *Six credit hours*

ML 2 Advanced French. Study of the seventeenth century dramatists, especially Corneille, Racine, and Molière. French prose of the seventeenth century.

PROFESSOR SMITH *Six credit hours*

ML 3 General Survey of French Literature. A general survey of French literary activity from 1600 to 1850. Some careful reading and translation from representative literary masterpieces in class. Lectures, collateral readings, and reports. (Open to students who have had ML 1 and 2 or their equivalents).

MR. SPIKER *Six credit hours*

ML 4 Nineteenth Century. Philosophy, history, criticism, drama, fiction, and poetry. Chateaubriand, Mme. de Staël, Hugo, Sainte-Beuve, Thierry, Merimée, Balzac, Lamartine, Beranger, Musset, Dumas père, Dumas fils, Scribe, Michelet, Thiers, Gautier, Sand, Renan, Taine, Augier, Sardou, Brunetière, Lemaitre, Faguet, Daudet, Zola, Maupassant, France, Loti, Coppée, de Vigny, Rostand. Lectures, collateral reading, and reports.

Six credit hours

SPANISH

ML 5 Elementary Spanish. Stress is laid on accurate pronunciation, mastery of elements of grammar, and the acquisition of vocabulary. Oral and written exercises. Reading of easy modern Spanish prose. Composition and conversation. Espinosa and Allen's Elementary Spanish Grammar. Roessler and Remy's First Spanish Reader. Crawford's Spanish Composition. Gil Blas. Padre Isla.

MR. SPIKER *Six credit hours*

ML 6 Advanced Spanish. Attention will be given to both practical and literary ends. Conversation and composition in Spanish throughout the year. Humphrey's Spanish Prose Composition. During the first half of the year representative plays and novels from the nineteenth century will be read and studied. During the second half either Cervantes, Don Quixote or the drama of Lope de Vega and Calderon will be studied. (For 1917-1918 Cervantes, Don Quixote will be chosen). Lectures, readings, and reports.

PROFESSOR SMITH AND MR. SPIKER *Six credit hours*

ITALIAN

ML 7 Elementary Italian. Study of Italian grammar with oral exercises in elementary composition. Grandgent, Italian Grammar. Easy reading in modern Italian.

PROFESSOR SMITH

Six credit hours

ML 8 Advanced Italian. Reading of more difficult Italian prose. Dante, La Divina Commedia.

PROFESSOR SMITH

Six credit hours

GERMAN

ML 9 German Elements. For those who do not present German as an entrance requirement. Study of German Grammar with oral exercises in elementary German composition. Joynes-Meissner, German Grammar, Bacon, Im Vaterland. Storm, Immensee.

PROFESSOR SMITH

Six credit hours

ML 10 Modern Prose Readings. For those who present German as an entrance requirement. Review of German Grammar. Bacon, German Composition. Heyse, Keller, Fulda, Sudermann. Prose Composition.

MR. BERNHARDT

Six credit hours

ML 11 Advanced German. Nineteenth Century. Schiller, Maria Stuart. Hauff, Lichtenstein. Heine, Die Harzreise. Scheffel, Trompeter von Säkkingen. Wait, German Science Reader, and other authors as time may permit.

PROFESSOR SMITH AND MR. BERNHARDT *Six credit hours*

ML 12 Classical Period. Goethe: Faust, Iphigenie, Gedichte. Schiller: Wallenstein's Tod, Gedichte. History of German Literature: The Classical Period.

Six credit hours

ML 13 German Novel. Study of the development of the modern German novel and reading of some of the

masterpieces of representative novelists. Lectures, collateral reading, and reports.

Mr. Bernhardt *Six credit hours*

PHYSICAL TRAINING

Assistant Professor McAvoy

It is the desire of the college to encourage some form of exercise on the part of the entire student body. It is believed that for the great majority of college men the best solution for the problem of rational and effective physical training is to be found in well regulated athletics. Gymnastic exercises are recognized as being readily adapted to the meeting of special needs and to the correction of bodily defects.

Special provision has been made for Freshmen and Sophomores. The Department has organized a system of exercises calculated to maintain and develop the physical strength of the student and at the same time prevent any of the evils which might arise from exercises that are too violent. The exercises thus provided for are obligatory upon the two above mentioned classes, subject to exception by the Physical Director.

For those not incapacitated nothing is more conducive to bodily growth and development than properly regulated athletic contests. Intercollegiate football games are held in the fall. Basketball and indoor work such as wrestling, boxing, and volley ball are given attention in the winter. Baseball and track work are given special attention in the spring.

By requiring every student to take a certain amount of exercises during the first part of the college course, it is thought that interest will be aroused and a habit of regularity will be established which is essential to his best health and efficiency throughout the remainder of his college course and after-life.

PT 1 Physical Training. Outdoor and indoor exercise. One hour.

One credit hour

PT 2 Physical Training. Athletic exercises. One hour.

One credit hour

PHYSICS

PROFESSOR HARTER AND ————

In the arrangement of the work in Physics the needs of all classes of students are considered. Three hours a week are given in lectures and recitations to students in the course in Agriculture throughout the Sophomore year and in any year to such students in the course of Arts and Science as may elect this study.

Four hours a week in the first term and three hours a week in the second term in the Sophomore year are required of all students in the several Engineering courses for lectures, recitations, and demonstrations. Two periods of two hours each are prescribed for laboratory work for all students in Physics. In the second term students in engineering give one of these periods to laboratory work in Electricity (E. E. 9).

A second year in Physics, with two hours of lectures and recitations and two periods of two hours each of laboratory work, is open to such students in the course of Arts and Science as may have completed Physics 1 and Physics 2.

Ps 1 General Physics. Recitations, lectures, demonstrations. For students in the courses of Arts and Science and of Agriculture.

PROFESSOR HARTER *Six credit hours*

Ps 2 Laboratory work in Physics. For students in the courses of Arts and Science and of Agriculture. Four hours.

———— *Four credit hours*

Ps 3 General Physics. Recitations, lectures, demonstrations. For students in Engineering. Sophomore year, first term.

PROFESSOR HARTER *Four credit hours*

Ps 4 General Physics. Recitations, lectures, demonstrations. For students in Engineering. Sophomore year, second term.

PROFESSOR HARTER *Three credit hours*

Ps 5 Laboratory work in Physics. For students in Engineering. Sophomore year, first term, four hours.

Two credit hours

Ps 6 Laboratory work in Physics. For students in Engineering. Sophomore year, second term, two hours.

One credit hour

Ps 7 A second year in Physics. Recitations, lectures, demonstrations. For such students in the course of Arts and Science as may elect work in Physics after the completion of Ps 1 and Ps 2.

PROFESSOR HARTER *Four credit hours*

Ps 8 A second year of Laboratory work in Physics. For such students as elect Ps 7.

PROFESSOR HARTER *Four credit hours*

PLANT PATHOLOGY

ASSISTANT PROFESSOR ELLIOTT

Pl Path 1 Plant Pathology. (Prerequisite: B 4, Ba 1). An elementary course covering the principal bacterial and fungous diseases of the more economic plants, with special emphasis on orchard and trucking diseases. Students will be expected to learn to recognize the more important diseases and to prescribe treatment. Some attention will be given to isolating and culturing parasitic bacteria and fungi.

Elective for students in Arts and Science and required of students in Agriculture. One hour lecture and four hours laboratory. Second term.

Three credit hours

POULTRY HUSBANDRY

Assistant Professor Cory

PH 1 General Poultry. A general course in the principles governing the scientific management of poultry, and the requirements and possibilities of the poultry industry. Housing, scoring and judging; breeding; feeds; feeding; types and breeds; hatching and rearing; sanitation; and market production. Elective for Sophomores in Agriculture. One lecture and two hours laboratory per week. Second term.

Two credit hours

PH 2 Advanced Poultry. (Prerequisite: PH 1). Types and breeds; housing; feeding and breeding. Elective for Seniors in Agriculture. Two lectures and four hours laboratory per week. First term.

Four credit hours

PH 3 Advanced Poultry. (Prerequisite: PH 2). Incubation and brooding of eggs; rearing of chicks; poultry products; poultry diseases and sanitation; poultry farm management. Elective for Seniors in Agriculture. Two lectures and four hours laboratory per week. Second term.

Four credit hours

PSYCHOLOGY AND EDUCATION

Professor Counts

The aim of this department is twofold: (1) It offers, for the present, two fundamental courses in Philosophy—Psychology and Ethics; and (2) it seeks to provide a specific training for those who intend to enter the teaching profession.

Psy 1 Introductory Psychology. The aim of this course is to acquaint the student with the general field of psychology, together with its methods, its aims, and its relations with the other social and biological sciences. First term.

Three credit hours

Psy 2 Ethics. A study of the origins of moral attitudes is followed by an analysis of the moral consciousness and a constructive criticism of our present moral standards. Second term.

Three credit hours

Psy 3 Introduction to Education. This course introduces the student to the general problems of education, and to the sources of information and methods that lead to a scientific study of them. Particular attention is given to the aim of education, the mental development of the child, individual differences, the psychology of learning, transfer of training, habit-formation, and educational tests. First term.

Three credit hours

Psy 4 Methods of Teaching High School Subjects. The various methods of teaching each of the high school subjects will be considered. Each student will be expected to make an especially careful study of the subject in which he is particularly interested. Second term.

Three credit hours

Psy 5 High School Administration. Attention will be given to the problems of administration and supervision which every high school principal must meet. The course will also include a brief summary of the history of secondary education in the United States. First term.

Three credit hours

Psy 6 Experimental Education. This course is designed to acquaint the student with the methods and achievements of experimental education. Educational scales and measurements will also be considered as instruments of supervision. Second term.

Three credit hours

SOIL BACTERIOLOGY

PROFESSOR MANNS

SB 1 Soil Bacteriology. (Prerequisites: Bacteriology 1; Chemistry 5). The course consists of a study of the economic importance of the invisible but highly active soil organisms. These organisms, the bacteria, fungi, and protozoa, have been shown in recent years to play an active part in soil fertility. A study will be made of their work in relation to ammonification, nitrification, and denitrification ;the influence of cropping and tillage on the flora; th eeconomic use of feztilizers and lime; bacteria in relation to the fixation of nitrogen by legumes.

The laboratory work will consist of a quantitative and qualitative study of the types of flora, i. e., the ammonifiers, nitrifiers, nodule organisms, and some parasitic fungi from sick soils; measuring the rate of nitrification, fixation of atmospheric nitrogen, and ammonification in different soils variously manured, fertilized, and limed. Elective for Seniors in Arts and Science and required of Seniors in Agriculture. One hour lecture and four hours laboratory. Second term.

Three credit hours

GENERAL INFORMATION

EXPENSES

Tuition

Tuition is free to students from the State of Delaware. The tuition for all other students is $25 a year.

Fees

	First Term	*Second Term*
INCIDENTIAL EXPENSES	$22.75	$20.25
Use of Library		
Use of Gymnasium		
Athletics		
Infirmary		
Ordinary "wear and tear"		
LABORATORY		
Shop		
Freshman year	3.75	3.75
Sophomore year	5.25	5.25
Junior year	3.75	3.75
Chemistry	7.50	7.50
Zoology	1.25	1.25
Botany	1.25	1.25
Bacteriology	2.50	2.50
Electrical Engineering		
Junior year	6.00	6.00
Senior year	6.00	6.00

MATRICULATION

A fee of $5.00 is charged to each student on entering college. This fee is collected but once.

ROOMS AND BOARD

Rooms. The first of the New College Dormitories will be opened in September, 1917. It will accommodate 59 students. The four Fraternity houses accommodate about 70 students. Other students may obtain rooms in the town. Beginning with 1918, all Freshmen will be required to live in the Dormitories. The College plans to house in dormitories to be erected all resident students who do not live in the Fraternity houses or in their own homes.

Rooms in the New College Dormitory are of two clases, single and en suite. There are 37 single rooms, and 11 suites consisting of a study room and two bedrooms. The College provides for each student a bed, chiffonier, study table, and two chairs. Other furnishings, including bed clothes and linen, must be provided by the student. All rooms are heated with steam and lighted with electricity.

Applications for rooms for 1917-1918 should be made to the Registrar of the College. In the assignment of rooms for the first year, Freshmen will be given the preference. Rooms must be engaged for the entire year. Proportionate deductions will be made in the case of students who leave college during the year. A deposit of $5.00 must be made when a room is rented.

Prices for rooms, including heat, light, and janitor service, range from $40 to $80 for each student. There will be accommodations for approximately 12 students at $40 for the year, 25 students at $50, 6 students at $60, and 16 students at $80.

Board. Beginning with September, 1917, all resident students, except those who live in their own homes, will be required to board in the College Dining Hall. Meals will be furnished at cost, the estimated price per week being $4.50. The actual cost may be slightly below or above this figure.

Estimated Total Expenses

The usual expenses for the year of a Freshman from the State of Delaware who boards in Newark may be estimated approximately as follows:

Matriculation	$ 5.00
Incidental expenses	43.00
Board, 38 weeks at $4.50	171.00
Room	50.00
Books	12.00
Laundry	18.00
Other incidentals (personal expenses)	25.00
Total	$324.00

For a student in Agriculture, $2.50 should be added for charges in Botanical Laboratory. For a student in Engineering, approximately $25 should be added for draughting instruments and Shop charges. For a student coming from another state, $25 should be added for Tuition.

The actual expenses of Freshmen range from a minimum of $160 (including Commuter's ticket from Wilmington) through a mean of $300 to a maximum of $530.

Payments

The matriculation fee of $5.00 must be paid at the time of registration.

The college bill for the first term is due and payable at the opening of the college year; the bill for the second term, at the opening of the second term. In order to be admitted to classes and laboratories, students must present to the Instructors in charge the Treasurer's receipt for the payment of the fixed charges of the college.

Registration

Application for admission to college should be made to the Secretary of the Faculty before Tuesday, September 18, 1917. Candidates for admission to the Freshman class are advised to submit their applications and credentials at the time of the Entrance Examinations in June or during the summer preceding the college year in which they

wish to enter. Sophomores, Juniors, and Seniors should register on or before Thursday, September 20, 1917.

Advisers

The adviser for the Freshman Class is appointed by the President at the beginning of each academic year. The advisers for the other classes are appointed by the President at the close of each academic year from a list of men chosen by the respective classes. For the academic year 1916-1917 the advisers are: Professor Koerber, Senior; Assistant Professor K. R. Greenfield, Junior; Assistant Professor Preston, Sophomore; and Asistant Professor Dutton, Freshman. Chairman of the Board, Dean Smith.

Attendance

Regular attendance is required at all college exercises. Suitable rules governing absences have been adopted and any student not observing them will be dropped from the college. Punctual return to the college after vacation or at the beginning of a term is insisted upon. All absences immediately preceding or following a vacation are counted double.

All work missed by reason of necessary absences must be made up to the satisfaction of the professor concerned; otherwise the student will be marked zero for each exercise missed. The privilege of making up work will not be granted after an unexcused absence.

Religious Instruction

The college is in no sense sectarian, but every student is expected to attend public worship at least once each Sunday at such place as parent or guardian may select. All students are required to be present at the daily morning chapel exercises.

Infirmary

To aid in caring for the health of the students, the college has established an Infirmary. In the building are

four rooms for ordinary cases, two rooms for contagious diseases, and an office for first aid. For the support of the infirmary, each student is assessed $2.50 a year. The work of the infirmary is in charge of Miss Alice Beck, a trained nurse.

Examinations

Examinations in all subjects are held at the close of each term and are conducted either in writing, or orally, as the nature of the subject may require or as the professor may prefer. Review examinations are also held at other times whenever, in the judgment of the professor, the objects of instruction may be promoted by such means. The examinations are designed not as a mere test of the student's knowledge, but as a valuable training in rapid, concise, and accurate expression. They serve as a valuable means of giving the student a ready command of his mental powers, and, by encouraging a review of a period of work, they give him a broader view and a firmer hold of the several subjects of study.

The Honor System was adopted by the student body in 1916.

In determining a student's fitness to proceed to a higher class great weight is given to the character of his performance of recitation room duties. The results of the term examinations are combined with the recitation records; but in fixing the student's standing, the quality of his recitation work is the weightier factor.

No student will be promoted unless he has completed three-fourths of the work of his class of the year just passed and has no condition in previous years unsatisfied.

Re-examinations

Students who fail in an examination in any subject are required to pay a fee of one dollar for a re-examination and two dollars for any re-examination thereafter. In order to be admitted to a re-examination students must present to the examiner a certificate properly signed showing that the fee has been paid. The money arising from

this source will be expended for books for the general library.

Elective Studies

Students must submit to the proper authorities, on or before May 15 of each academic year, schedules showing elective courses for the following year.

Reports

At the close of each term a report of the student's general combined recitation and examination record will be sent to his parents or guardian. These reports show the course of study the student is pursuing and the class in which he is enrolled. Parents are urged to give these reports close attention, and, when the reports indicate any lack of attention to duty, to co-operate with the Faculty in correcting habits of idleness and indifference.

Students' Self-Aid

During the autumn of 1914, the President appointed a committee to secure employment for students who depend on their own resources. This committee endeavors to secure such employment as will interfere least with the regular college work. All students wishing to avail themselves of opportunities thus offered are required to register with the chairman of the committee, Professor Harold E. Tiffany.

PRIZES AND SCHOLARSHIPS

The Bishop Coleman Memorial Prize

The Bishop Coleman Memorial Prize of twenty-five dollars is offered annually to the member of the graduating class having in all respects the best standing in the Senior year.

The Alumni Prizes

To encourage literary work among the students, the Alumni Association offers two prizes of thirty dollars and twenty dollars respectively to the best and second best debaters in an annual contest. The winner of any one of the prizes is not eligible to contest for that prize again.

Lieutenant Clarke Churchman Memorial Prize

The Delaware Daughters of the American Revolution and friends of Lieutenant Clarke Churchman have established a "Lieutenant Clarke Churchman Memorial Fund," the income from which is to be used for the encouragement of military virtues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in the military department. The prize derived from this fund amounts annually to twenty-five or thirty dollars.

The Philo Sherman Bennett Prize

The Hon. William Jennings Bryan, in carrying out the will of Philo Sherman Bennett, Esq., late of New Haven, Connecticut, has designated Delaware College as one of the twenty-five colleges or universities to receive its share of an endowment of ten thousand dollars to be invested and the proceeds to be applied to the payment of an annual prize "for the best essay discussing the principles of free government." Delaware College has accordingly received four hundred dollars in trust for this purpose, and from the income derived from this sum an annual prize will be awarded to the undergraduate student who presents the best essay in the fields prescribed. The income from this fund yields an anuual prize of twenty to twenty-five dollars.

The William D. Clark Prize for Mathematics

The late Miss Julia Newton Clark, in memory of her father, William D. Clark, offered a prize of twenty-five dollars to be awarded at the end of the Sophomore year to the student who had shown the greatest proficiency in Mathematics during his Freshman and Sophomore years. Since her death this prize has been given by Miss Emma Clark.

Trustee Prize

A prize of fifty dollars is offered by a Trustee to the Junior who, during the first three years of his course, has maintained the highest general average of proficiency in all college activities, such as The Review, Literary Society, Y. M. C. A., the Agricultural Club, Athletics, Orchestra, and Courses of Study.

Only those students who have spent three years in residence at Delaware College will be considered.

The State Grange Prize

For the purpose of encouraging a high standard of work in the Agricultural courses, the Delaware State Grange has offered three cash prizes of fifteen dollars, ten dollars, and five dollars in gold to be awarded respectively to the three students pursuing the course in Agriculture who have manifested the greatest interest, and made the greatest progress in their work during the year for which the prizes are awarded.

The Francis A. Cooch Botanical Prizes

To promote interest in botanical studies, Mr. F. A. Cooch, '93, has offered two cash prizes of fifteen and ten dollars respectively to students in B4 making the best and second best collection of flowering plants, ferns, and their allies native to the State of Delaware.

Old Home Prize (*William H. Purnell Memorial*)

This prize was established by persons interested in the life, history, and biography of the Delmarvia peninsula, and made a memorial to President Purnell. The annual income from a fund of $500 is available for this prize, to be awarded for the best essay on some phase of the history of Delaware or the "Eastern Shore." It is open to all students. Successful essays will be read by title on Commencement Day and will be bound and filed in the College Library. Essays of sufficient merit may be published. Rules for the guidance of contestants will be posted.

The Edward F. Mullen Prize in Civil Engineering

A prize of twenty-five dollars is offered by Mr. Edward F. Mullen, '95, to the student in the Senior year of the Civil Engineering course who displays most originality in preparing and writing his thesis for graduation.

Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware

A scholarship amounting to $100 annually was founded in 1914 by the Harvard, Princeton, and Yale Clubs of Delaware. It will be awarded to a deserving Delaware boy. The appointment is made for one year only, but the incumbent for any one year may be reappointed.

The Robert Bayne Wheeler Scholarship

Mrs. Robert Bayne Wheeler has given to the college $2500, the income from which, amounting to about $125, is to be given annually to a deserving Delaware boy to whom this amount will be of service in helping him to obtain an education.

THE TATUM MEMORIAL LECTURE FUND

Mr. Ashton R. Tatum, a friend of the College, at his death left a fund of $1000, the income from which is to be devoted to lectures on the treatment and care of horses.

LIBRARIES

The combined libraries of the college contain about 22,000 volumes.

Each department of instruction has its own library of reference works in its classroom or laboratory, under the immediate supervision of the professor in charge, from whom students may obtain books for use in connection with their work.

The general library, in which are most of the books on literature, history, economics, philosophy, etc., is, together with the reading-room, open to students from 8.15 a. m. to 10 p. m.

The library has been designated as one of the depositories for the public documents of the United States Government and from this source receives many valuable publications.

Several friends of the college have made valuable additions to the library by the presentation of books, magazines, and pictures, and further gifts are earnestly desired.

Through the courtesy of the publishers many of our State papers are regularly found on the tables of the Reading Room.

ATHLETICS

Football, baseball, basketball, track athletics, and tennis are recognized as collegiate sports.

The general supervision of all athletic sports is vested in an athletic council composed of two members of the Faculty, two members of the Alumni Association, and three undergraduates, chosen from the three upper classes.

All eligibility rules originate with the Faculty.

Any student who is admitted to college later than the

second Monday of a term is not eligible during that term to represent the college in outside athletic contests.

No student is permitted to represent the college on any athletic team or as manager of such, who is not in good standing in his class and doing, at the time, satisfactory work in his studies.

No student pursuing a course other than one leading to a degree will be permitted to represent the college in any athletic contest during his first year in residence, unless he shall have satisfied the entrance requirements of a course leading to a degree.

Buildings and Grounds

A spacious gymnasium containing apparatus for gymnastic exercises, a running track, shower baths, and a swimming pool, affords ample accommodations for indoor athletic sports, such as basketball, indoor-running, swimming contests, wrestling, and boxing.

In Frazer Field, the college possesses one of the best athletic fields in the country. This field, completely equipped, was donated to the college by Mr. and Mrs. Eben B. Frazer of Newark, and Mr. Stanley Frazer, '04, of New York City, as a memorial to a son and brother, Joseph Heckart Frazer, '03. The field contains a baseball diamond, football gridiron, tennis courts, and a quarter-mile cinder track with a 220-yard straightaway. It is enclosed with a hollow tile stucco wall and has a beautiful terrace along one side.

State Chemist. The Professor of Chemistry in the college is by legislative enactment ex officio State Chemist of Delaware.

State Bacteriological and Pathological Laboratory. By Act of the Delaware Legislature, a State Bacteriological and Pathological Laboratory has been established at

the college. The Laboratory is under the management of the State Board of Health. Its location makes accesible the resources of the college in the way of libraries and apparatus.

ORGANIZATIONS

The Agricultural Club. The Agricultural Club is composed of the agricultural students and some members of the Faculty. It is under the management of the students, who elect their officers each term. Meetings are held weekly and subjects relating to both class work and actual farm practice are discussed. Lecturers of repute address the club on agricultural subjects. The object of the club is to create enthusiasm and to promote the interests of agriculture among the students as well as to accustom the members to talk on agricultural subjects before an audience.

Arts and Science Club. Juniors and Seniors in Arts and Science who have no conditions are eligible to memmership in this organization. Instructors in the department are members ex officio.

Athletic Association. The Athletic Association is a student organization which takes charge of details of athletic affairs not controlled directly by the Athletic Council.

Athletic Council. The Athletic Council is in direct charge of all athletic activities not constituting a part of the college curriculum. It is composed of two representatives from the Faculty, two representatives from the Alumni, and three representatives from the Students, representing respectively the Senior, Junior, and Sophomore classes.

Engineering Society. Membership in the Engineering Society is limited to Sophomores, Juniors, and Seniors, and to Instructors in the Department. Open meetings are occasionally held.

Fraternities. Three national Greek letter fraternities have local chapters at the college: Kappa Alpha (Southern), Sigma Nu, and Sigma Phi Epsilon. A fourth organization, Omega Alpha, is local. Three of these fraternities own their houses. The average resident membership is about sixteen.

Literary Societies. Two literary societies, each nearly as old as the College, have been not only important adjuncts to the social life of the institution, but also valuable aids in its educational work.

The Athenaean Literary Society was founded December 18, 1834, about six months after the opening of the College. The Society's first constitution was adopted in February, 1835, and the Society was incorporated by Act of the Delaware Legislature, February 11, 1881.

The Delta Phi Literary Society, which claims for itself somewhat greater age than its rival, was legally incorporated January 12, 1835. The Society obtained a new charter from the Legislature of Delaware about 1871, and another one in 1895.

Music. The musical organizations of the college consist of the Orchestra, the Mandolin Club, and the Glee Club.

Phi Kappa Phi. A Chapter of the Phi Kappa Phi, an honorary fraternity devoted to the interests of Scholarship, was established at the college in 1905.

Young Men's Christian Association. The college Y. M. C. A. is under the management of the students, who annually elect their officers and various committees. The object of the association is to promote Christian fellowship among the students and to furnish to all an opportunity for practical Christian work.

PUBLICATIONS

The regular publications of the college consist of the Delaware College Review, the Delaware Farmer, the Bulletin, and the Experiment Station Bulletin. The Review and the Delaware Farmer are student publications.

The Review. The Review is a weekly publication devoted to the general interest of the students. The subscription price is one dollar a year.

The Delaware Farmer. The Delaware Farmer is published monthly during the college year by the Agricultural Club of Delaware College. The purpose of The Delaware Farmer is two fold: (1) to publish unbiased scientific facts applicable to farm practices on the Delmarvia Peninsula; (2) to aid in placing the work of Delaware College before as many people as possible. The subscription price is fifty cents per year.

The **Bulletin** is issued quarterly. One of the four numbers is the Catalogue number. The **Experiment Station Bulletin** is issued quarterly by the Experiment Station. One of the numbers is the Annual Report. These bulletins will be sent to any address.

Students' Loan Fund. A Loan Fund to help needy students was established by the Alumni Association in 1915. The object of the Committee, which was appointed by the President of the Association, is to raise a substantial sum of money which will be placed in trust and the income of which will be used to help deserving students. Definite amounts will be loaned to students on promissory notes which the student is expected to meet as soon as he is financially able.

COLLEGE EXTENSION

THE IDEA

The function of a State College is to meet the educational needs of the people in all feasible ways. The services of the faculty and the resources of libraries and laboratories should be made available not merely for the young people who come to the campus but for the larger constituency in the communities throughout the State. It is recognized today that the College and the people should be in the closest touch. Delaware Colloge and the Women's College of Delaware wish to meet their obligations to the fullest extent, and therefore propose the following plans for extension work during the year 1917-1918.

LECTURES

It must be borne in mind that the extension work of the college is primarily educational and does not pretend to establish a mere entertainment bureau. While the work maintains the ideals and standards of the college, it is believed that the lectures offered by the faculty will appeal to all classes and that they will fill the need for sound but interesting discussions of problems along the various lines of work represented. Some of these lectures are illustrated by lantern slides. From the list of topics outlined below, it is easy for schools, churches, granges, or clubs, to arrange for a single lecture or for a series of lectures running through the winter months. In the last two years nearly two hundred lectures have been given in Delaware and neighboring states.

It should be remembered, however, that no person is engaged solely for extension work, and that whatever the faculty does in this way is done because of a desire to forward the interests of the college and of the State. As the first duty is to the regular classes at the college, each member of the faculty can deliver only a limited number of extension lectures each month. But the college will do

all in its power to meet the wishes of the various communities, and requests for lectures will be honored in the order in which they are received.

EXTENSION STAFF AND LECTURES

Delaware College

PROFESSOR ELISHA CONOVER

Latin and Greek

1 The Value of Classical Studies
2 The Private Life of the Romans

PROFESSOR GEORGE S. COUNTS

Psychology and Education

1 Modern Tendencies in Education
2 The Science of Education
3 The School as a Community Center
4 The Immigration Problem
5 Primitive Man

ASSISTANT PROFESSOR G. E. DUTTON

English

1 Walt Whitman the Poet
2 Sidney Lanier
3 The Spirit of American Literature
4 The Poetry of the American Revolution
5 The Poetry of the Civil War
6 Cowboy Songs and Ballads

PROFESSOR A. E. GRANTHAM

Agronomy

1 Some Tendencies of Rural Life
2 The Farm in Literature
3 The Origin of Our Cultivated Plants
4 Efficiency in Farm Management
5 The Story of Wheat. Illustrated
6 Recent Advances in Agricultural Science
7 The Country Gentleman

ASSISTANT PROFESSOR K. R. GREENFIELD

History and Economics

1 The Forging of the Industrial Age
2 Italy, its Dreamer and his Kingdom
3 Socialism Today

PROFESSOR G. A. HARTER

Mathematics and Physics

1 The Solar System
2 The Wonders of the Heavens
3 The Physics of the Household
4 The Physics of the Weather
5 Physics of our Daily Life

PROFESSOR HARRY HAYWARD

Animal Husbandry

1 Some Problems of the Open Country
2 Taking Stock
3 Our Careers
4 Epoch Makers in Agriculture
5 The Church and Agriculture
6 Some Famous Farm Animals

ASSISTANT PROFESSOR W. J. McAVOY

Physical Director

1 The Value of Play
2 True Sportsmanship

PROFESSOR C. A. McCUE

Horticulture

1 "The Dooryard"
2 Life Through Death
3 Across the Painted Desert

PROFESSOR THOMAS F. MANNS

Plant Pathology and Soil Bacteriology

1 Our Policy in the Philippines
2 The Relation of Life in the Soil to Agriculture
3 The Seed Potato—Its Vitality and Diseases
4 Plant Diseases and Their Control

PROFESSOR CLARENCE A. SHORT

Mathematics and Engineering

1 Water Purification
2 Sewage Disposal and its Relation to Disease
3 Road Improvement
4 Rural Sanitation
5 The Winter Skies
6 The Worth of an Education

PROFESSOR E. L. SMITH

French and German

1 Napoleon Bonaparte
2 Paris
3 Great German Cities

PROFESSOR W. O. SYPHERD

English

1 Literature and Life
2 The Bible in English Literature
3 Dickens and the Modern Reader
4 The Battle of the Books
5 Othello as a Representative Shaksperean Tragedy
6 Kipling as a Short-Story Writer
7 Joseph Conrad, a Writer of the Sea

PROFESSOR FIRMAN THOMPSON

Agricultural Chemistry

1 Chemistry and Civilization
2 Under the Southern Cross
3 The Hawaiian Islands

PROFESSOR E. V. VAUGHN

History and Economics

1 Interesting Facts in Delaware History
2 Social Life in Colonial Delaware
3 Our Town—A Typical Community
4 An Hour with Tennyson

ASSISTANT PROFESSOR A. C. WHITTIER

Agricultural Chemistry

1 How We Live—Nutrition
2 The Chemistry of Everyday Life

The Women's College of Delaware

PROFESSOR MYRTLE V. CAUDELL

Home Economics

1 Women as Spenders
2 Meat and Meat Substitutes
3 Beneficial Beverages
4 Bread and Breadmaking
5 The Art of Home Making

PROFESSOR MARY E. RICH

Education

1 The Organization of Parent-Teacher Associations
2 Better School Buildings
3 A Reading Course for Children
4 The Value of the Traveling Picture Library
5 The Moral Training of Children

DEAN WINIFRED J. ROBINSON

1 Community Music
2 Yellowstone National Park. Illustrated
3 Yosemite Valley. Illustrated

MISS HARRIETTE H. WINSLOW

Art

1 Raphael
2 The Study of Pictures

ALUMNI ORGANIZATIONS AND ACTIVITIES

The Alumni Association of Delaware College is the central organization for the general body of Alumni. Membership is limited to graduates, and to other former students who may be elected by the Association.

The Annual Business Meeting is held on Commencement Day. On Tuesday and Wednesday of Commencement Week, various reunions and celebrations are held. A mid-winter dinner is held every year in February.

An Endowment Fund of $100,000, from the income of which the salary of the President of the College is paid, was started in 1913. It has already reached the sum of $67,000.

Two prizes in debating are offered annually by the Association to undergraduates who take part in a contest between the two literary societies. Medals for the winners of events in the Inter-Class Track and Field Meet are given by individuals among the Alumni.

The official organ of the Alumni Association is the Alumni News, a quarterly. The subscription price, which includes membership in the organization, is $2.00 per year.

The Editor is Harlow H. Curtis, '87*, and the Business Manager, C. A. Short, '96.

The officers of the General Alumni Association for 1916-1917 are: President, T. Bayard Heisel, '88; Vice-President, R. B. Wolf, '96; Secretary, Harlow H. Curtis, '87*; and Treasurer, G. E. Dutton, '04.

Graduates in various parts of the country have begun to organize branch alumni associations. Up to the present time, three active branches have been formed: The Westrn Pennsylvania Section, Pittsburgh, Pa.; the New England Society, Boston, Mass.; and the Philadelphia Society, Philadelphia, Pa.

* Deceased, 1917

DEGREES CONFERRED AT THE ANNUAL COMMENCEMENT

JUNE 14, 1916

Doctor of Laws

Charles Robert Miller	Wilmington
James Pennewill	Dover
Henry Ridgely	Dover
Edward Noble Vallandigham (Ph. B. 1873)	Chestnut Hill, Massachusetts

Doctor of Pedagogy

Albert Henry Raub	Philadelphia, Pennsylvania
Clifford John Scott	Wilmington

Master of Agriculture

Oliver Ambrose Newton	Bridgeville

Civil Engineer

David Livingston Sloan (B. S. in C. E. 1912)	Narberth, Pennsylvania

Mechanical Engineer

Robert Bunsen Wolf (B. S. in E. E. 1896)	Berlin, New Hampshire

Electrical Engineer

Clarence Edward Taylor (B. S. in E. E. 1911)	Wheeling, West Virginia

Bachelor of Arts (Arts and Science Course)

Howard Wellington Bramhall	Georgetown
James Ellis Brayshaw	Delmar
John Wesley Jones	Woodside
Carlton David Pepper	Georgetown
Harris Samonisky	Delaware City
Carlton Beck Walls	Smyrna

Bachelor of Science (Arts and Science Course)

Edward William Martin	Wilmington

Bachelor of Science in Agriculture

Frazier Groff	Clayton
Lionel George Mulholland	Riverside, N. J.
Warren Childs Newton	Bridgeville
James Henry Salevan	Milford
George Oscar Smith	Narberth, Pennsylvania
Robert Weimer	New York, New York

Bachelor of Science in Civil Engineering

James Alexander Crothers	North East, Maryland
Wesley de Valinger	Middletown
Gerald Paul Doherty, Jr.	Wilmington
Harold Morrison Foster	Wilmington
Oscar Franklin Edwin Gentieu	Wilmington
Augustus Howell Graham	Charlestown, Maryland
Benjamin Frank Morrison, Jr.	Wilmington
William Compton Wills	Wilmington

Bachelor of Science in Mechanical Engineering

Edward Harvey Clouser	Marshallton
Homer Hazel Ewing	Wilmington
Donald Adams Price	Wilmington
Harry Vandom Taylor	Dover

Bachelor of Science in Electrical Engineering

Leo Blumberg	Wilmington
John Michael Price	Wilmington

Bachelor of Science in Chemical Engineering

Frank Haley Buck	Rockland
Walter Leslie Haley	Wilmington

PRIZES, SCHOLARSHIPS, AND HONORS ANNOUNCED AT THE COMMENCEMENT OF 1916

The Bishop Coleman Memorial Prize: Edward William Martin

The Alumni Prizes: First, William Terry Mitchell; second, Thomas Smyth Carswell

The Lieutenant Clarke Churchman Memorial Prize: George Oscar Smith

The Freshman English Prize: Herman McKay

The Philo Sherman Bennett Prize: John Wesley Jones

The William D. Clark Prize for Mathematics: Thomas Smyth Carswell

The Trustee Prize: LeRoy Bayard Steele

The State Grange Prizes: First, William Homer Savin; second, George Madara Longland; third, Joseph Irwin Jefferis

The Francis A. Cooch Botanical Prizes: First, Herman McKay; second, Francis Leonard O'Rourke

The William H. Purnell Prize in Modern Languages: French, William Terry Mitchell; German, Paul DeWitt Lovett

The Edward F. Mullen Prize in Civil Engineering: Oscar Franklin Edwin Gentieu

The Colonel Robert G. Rutherford, U. S. A. Prize: Paul DeWitt Lovett

The following members of the Class of 1916 were elected to the Honorary Fraternity of Phi Kappa Phi:

Leo Blumberg
Homer Hazel Ewing
John Wesley Jones
Edward William Martin
Warren Childs Newton
Donald Adams Price
John Michael Price.

The Scholarship of the Harvard, Princeton, and Yale clubs of Delaware for 1916-1917 was awarded to Robert Sumwalt, class of 1918.

The Robert Bayne Wheeler Scholarship for 1916-1917 was awarded to Robert Bayne Wheeler, 2d, class of 1918.

STUDENTS IN ATTENDANCE DURING THE COLLEGIATE YEAR 1916-1917

Abbreviations: A. & S., Arts and Science; A., Agriculture; C. E., Civil Engineering; M. E., Mechanical Engineering; E. E., Electrical Engineering; Ch. E., Chemical Engineering; E., Engineering not specified.

SENIOR CLASS

Appleby, Richard Morrison	A.	New Castle
Beauchamp, John Hurst	C. E.	Wilmington
Cameron, Raymond Mearns	A. & S.	North East, Md.
Campbell, Franklin Tracy	A.	Washington, D. C.
Ewing, Harvey Wilson	A.	Zion, Md.
Fidance, Michael Joseph	C. E.	Wilmington
Fischer, Carl Rudolph	A.	Philadelphia, Pa.
Gilman, Francis Albert	A.	Philadelphia, Pa.
Hastings, James Carlton	A. & S.	Laurel
Heinel, Arthur Garret	A. & S.	Newark
Heinel, James McConnell	A.	Newark
Hopkins, John Abel, Jr.	A.	Newark
Horsey, Harold Wolfe	A. & S.	Dover
Jones, Joseph Holton	C. E.	Wilmington
McCaghey, Frederick Colin	A. & S.	Baltimore, Md.
Marshall, William Virden	A.	Lewes
O'Daniel, John Wilson	A.	Newark
Pepper, Robert Houston	A. & S.	Philadelphia, Pa.
Ruth, Albert	C. E.	Wilmington
Smith, Chester	M. E.	Henry Clay
Smyth, Edwin Gaylord	C. E.	Wilmington
Steele, LeRoy Bayard	C. E.	Elsmere
Veasey, Harold Mercer	Ch. E.	Wilmington

JUNIOR CLASS

Alderson, John Hartzell	A. & S.	Wilmington
Alexander, Harry Bratton	A. & S.	Elkton, Md.
Alexander, John William	E. E.	Elkton, Md.
Berkman, Alec	E. E.	Middletown
Bowen, Knowles Ritchie	C. E.	Newark
Bratton, Howard, Jr.	A. & S.	Elkton, Md.
Broadwater, Howard Allen	A.	Wilmington
Brown, Gassaway Bond	A. & S.	Newark
Cannon, Samuel	A. & S.	Wilmington

Cannon, William Dail	E. E.	Bridgeville
Carswell, Thomas Smyth	Ch. E.	Wilmington
Catts, Elmer Paul	E. E.	Clayton
Cleaver, Henry Paul	C. E.	Marshallton
Crockett, David Leonard	A.	New York, N. Y.
Davis, Jonathan Farr	A.	Meshoppen, Pa.
Goldey, Robert Perkins	A.	Wilmington
Gum, John Poole	A. & S.	Frankford
Hastings, Vaughn Archelaus	A. & S.	Delmar
Herdman, Rowland Delaware	A. & S.	Newark
Hill, Robert Clarke, Jr.	E. E.	Redden
Hoey, William Bigelow	E. E.	Frederica
Hoffecker, Elwood	A.	Newark
Holland, Clyde Simpson	A.	Smyrna
Horsey, Donald Pancoast	A. & S.	Dover
Hudson, George Allen	A. & S.	Lewes
Lauritsen, Allen Louis	C. E.	Lewes
Little, James Herman	E. E.	Newark
Lovett, Paul DeWitt	A. & S.	Newark
Marks, Ernest Melson	Ch. E.	Wilmington
Meyers, Charles Fulmer	Ch. E.	Middletown
Mitchell, Morris Randolph	A. & S.	Newark
Mitchell, William Terry	M. E.	Newark
O'Daniel, James Allison	A.	Newark
Reynolds, Irving	A. & S.	New York, N. Y.
Savin, William Homer	A.	Cheswold
Saylor, Frank	A. & S.	Wilmington
Smith, Chester Richland	A.	Narberth, Pa.
Stayton, Leon Busick	A. & S.	Wilmington
Sumwalt, Robert Llewellyn	C. E.	Lewes
Swayne, Paul Gilbert	A.	Wilmington
Swing, David Thompson	M. E.	Ridgely, Md.
Taylor, Nathaniel Watkins	A.	Dover
Todd, DeWitt Clinton Davis	C. E.	Wilmington
Walton, Albert Slack	E. E.	Newark
Weigle, Charles Leland	A. & S.	Wilmington
Wheeler, Robert Bayne, 2d	A. & S.	Wilmington
Wilson, Ernest Staton	C. E.	Wilmington
Wilson, Marvel	A.	Ellendale
Witsil, Lawrence Raymond	E. E.	Wilmington

SOPHOMORE CLASS

Aker, Raymond Buehm	C. E.	Delaware City
Arbuckle, Paul Taylor, Jr.	Ch. E.	Cherry Hill, Md.
Aschenbach, Andrew Augustus	A. & S.	Wilmington
Barkley, Robert James	C. E.	Clayton
Barnard, Daniel Paddock, 4th	Ch. E.	Wilmington

Boggs, Irving Hook	M. E.	Dover
Booth, Thomas Reed	A.	Brooklyn, N. Y.
Brown, David Harvey	A. & S.	Wilmington
Cannon, Edward	Ch. E.	Wilmington
Cantwell, Garrett Reed	A. & S.	Wilmington
Cole, John Clement	E. E.	Delmar
Craig, John Gilbert	E.	Wilmington
Cranston, Francis Benjamin	A.	Stanton
Crothers, John Lawson	A.	North East, Md.
Dickey, Richard Earle	A.	Stanton
Evans, Nathaniel Hickman	A. & S.	Lewes
Ewing, Earle Elisha	M. E.	Wilmington
Fitzpatrick, William Stephen	A. & S.	New York, N. Y.
Gutowitz, Abraham	A. & S.	Lewes
Hamilton, Stewart Alexander	E. E.	Frederica
Hearne, George Wilson	A. & S.	Georgetown
Humphrey, James Willard	Ch. E.	Claymont
Jefferis, Joseph Irwin	A.	Stanton
Lang, George Millard	E. E.	Wilmington
Levey, William Scott	Ch. E.	Christiana
Lindsay, Harvey Rose	A.	Providence, Md.
Litz, Joseph Leslie	M. E.	Wilmington
Longland, George Madara	A.	Mt. Pleasant
Loose, Harry Walter	E. E.	Wilmington
Mackie, John Alfred	A. & S.	Kemblesville, Pa.
Marshall, Robert Twilley	M. E.	Chincoteague, Va.
Marston, Henry White	A.	Wilmington
Martenis, Fred Boorman	A.	Wilmington
Maxwell, Joseph Pierson	E. E.	Wilmington
McElwee, Irviene Reed	Ch. E.	Wilmington
McKay, Herman	A. & S.	Wilmington
McKinney, William	E. E.	Wilmington
McMillan, James Gordon	A. & S.	Wilmington
Meier, Charles Gottlieb	Ch. E.	Newark
Meredith, John Hazel	A.	Goldsborough, Md.
Middleton, Leonard	C. E.	Wilmington
Mitchell, Henry Burton, Jr.	A. & S.	Millsboro
Moore, Willard Springer	E. E.	Wilmington
O'Rourke, Francis Leonard	A.	Newark
Penuel, Firman Clarence	A.	Georgetown
Pierson, William Morris	A. & S.	Wilmington
Plam, Louis	A.	Brooklyn, N. Y.
Plam, Michael Walter	E. E.	Brooklyn, N. Y.
Plumley, Eli Earl	M. E.	Wilmington
Proctor, Francis Edward	A. & S.	Wilmington
Raughley, Talbott	A.	Dover
Robinson, Jay	Ch. E.	Wilmington
Stewart, William, Jr.	A. & S.	Wilmington

Sturgis, Russell Davis	A.	Wilmington
Taggart, Rudulph York	C. E.	Elkton, Md.
Truss, James Petheram	A. & S.	Wilmington
Tunnell, Charles Rodney	A.	Georgetown
Tyson, Frank Howell	A. & S.	Middletown
Warner, Charles Curtis	C. E.	Delaware City
Webb, Edwin Shipley	M. E.	Wilmington
Weldin, Herbert Frederick	C. E.	Wilmington
Wessells, Wilbert Thomas	E. E.	Burlington, N. J.
Wise, William Arthur	A. & S.	Wilmington
Wright, Roland Cooper	C. E.	Seaford

FRESHMAN CLASS

Anderson, John White, 3d	E. E.	Wilmington
Barnard, William Ellison	A. & S.	Camden
Bernardo, John Ralph	A. & S.	Wilmington
Blickle, William Kopp	A. & S.	Wilmington
Brewer, Wayne Curtis	E. E.	Lewes
Bugless, Edgar	E. E.	Wilmington
Carey, Lawrence Sherwood	A. & S.	Georgetown
Carswell, Charlesworth	C. E.	Wlimington
Carter, Francis Bayard	A. & S.	Wilmington
Casey, Daniel Joseph	A. & S.	Wilmington
Chambers, James Brady	E. E.	Lewes
Chillas, Arthur Shapland	A. & S.	Newark
Clancy, James Dawson	A. & S.	Camden, N. J.
Cleaver, Charles Vanleer	A.	Marshallton
Colpitts, Robert Adrian	E.	Mt. Pleasant
Cullen, George Steele	A.	Elkview, Pa.
Daly, Leonard Barrett	A.	Philadelphia, Pa.
Dare, Mark Donald	A.	Jamesburg, N. J.
Dougherty, Alfred Paul	Ch. E.	Wilmington
Durstein, Ralph Keck	A. & S.	Wilmington
Edwards, Charles Grubb	A. & S.	Wilmington
Ely, George Amos	A.	Winterthur
Fell, Harvey Lewis	A.	Wilmington
Ferguson, George Harvey	A. & S.	Newark
Fletcher, Corbin Drummond	C. E.	Wilmington
Franklin, George Washington, 3d	Ch. E.	Wilmington
Goggin, Henry Reed	A.	El Paso, Texas
Gordy, Leon Hackett	M. E.	Wilmington
Gough, Joseph Thomas	E. E.	Bear
Graves, Reed	E.	Marietta, Pa.
Greene, Harry Carrow	Ch. E.	Newark
Grier, Harold Caulk	A. & S.	Milford
Handy, Joseph Breckinridge, Jr.	A. & S.	Stapleton, N. Y.
Hanley, Thomas Richard	A. & S.	Wilmington

Hardin, Paul Eugene	A.	Wilmington
Henvis, Edmund Wollaston	A. & S.	Wilmington
Holton, Walter Dean	A. & S.	Newark
Hudson, George Henry, Jr	C. E.	Wilmington
Jann, Paul Frederic	A.	Philadelphia, Pa.
Keesey, Russell Kirk	E.	Perryville, Md.
Kennedy, Eugene Harlan	E. E.	Newark
Kennedy, Ralph Pickering	Ch. E.	Marshallton
Kite, Robert Paul	Ch. E.	Wilmington
Lattomus, Winfield Wilson	C. E.	Townsend
Lindell, William Francis	E. E.	Newark
Loraine, John Cavender	M. E.	Chesapeake City, Md.
Loraine, Toward Nevison, Jr.	M. E.	Chesapeake City, Md.
Madden, George Harney	A.	New Castle
Manahan, Everett Cutler	C. E.	Wilmington
Marvel, Phillip Henry	E. E.	Houston
McCardell, Frank Paul	A.	Wilmington
McCorkindale, William James, Jr.	A.	Wilmington
McDonnell, Thomas Joseph	E.	Wilmington
McWhorter, John Francis, Jr.	A. & S.	Middletown
Nelson, George Merle	E. E.	Delmar
Olcott, John Woodward	A.	Washington, D. C.
O'Neill, John Francis	Ch. E.	Wilmington
Pool, Frank Robinson, Jr.	A.	McDonough
Roach, Lee	Ch. E.	Wilmington
Robinson, Merrill Hardenbrook	E. E.	Newark
Ritz, Walter Raymond	A. & S.	Newark
Russo, Julio	E. E.	Wilmington
Selby, John Griggs	C. E.	Camden, N. J.
Silver, Bernard Harry	A. & S.	Wilmington
Smith, Charles Bush	Ch. E.	Wilmington
Smith, Draper	Ch. E.	Wilmington
Sylvester, William Bayard	A.	Felton
Terrell, Hasson Taylor	Ch. E.	Elkton, Md.
Thomas, Norman	M. E.	Canterbury
Van Dyke, George	A. & S.	Smyrna
Vogdes, Jesse Tyson, Jr.	A	Philadelphia, Pa.
Wagamon, John Burton	A. & S.	Georgetown
Walker, Richard Blockson	Ch. E.	Wilmington
Whiteman, Thomas Moore	A.	Delaware City
Work, John Fulton	E. E.	Cherry Hill, Md.

SPECIAL STUDENTS

Blair, Alexander, Jr.	A. & S.	Wilmington
Brower, George Clarence	M. E.	Federalsburg, Md.
Keyes, Clarence Edward	A.	Farmington
Kister, Henry LeRoy	A.	Philadelphia, Pa.
Lambert, Samuel Taylor	A.	Riverside, N. J.
Marconetti, Arrigo Eugene	A.	New York, N. Y.
Martin, Emilio Eleuterio	A.	New York, N. Y.
Musser, James Russell	A.	Philadelphia, Pa.
Price, William, Jr.	A.	Middletown
Spruance, Owen Evans	A.	Smyrna
Stephens, Leonard Calvert	A.	Philadelphia, Pa.
Suer, Harry David	A.	Marhsallton
Sutfin, Charles Ide	A. & S.	Wilmington
Thomas, Alfred Bailey	A.	Philadelphia, Pa.
Ward, Jesse Collins	E. E.	Harrington
Williams, Thomas Edward	A.	Haddonfield, N. J.

SUMMARY

	ARTS AND SCIENCE	AGRICULTURE	ENGINEERING	TOTAL
Seniors	6	9	8	23
Juniors	17	12	20	49
Sophomores	17	16	31	64
Freshmen	21	17	37	75
Special	1	12	2	16
	63	66	98	227

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DELAWARE COLLEGE BULLETIN

VOLUME XIII NEW SERIES NUMBER 3

FEBRUARY 1918

ANNUAL CATALOGUE

1917-1918

As a war-time economy, the size of the Delaware College Catalogue for 1917-1918 is reduced to 48 pages

PUBLISHED QUARTERLY BY THE COLLEGE

NEWARK, DELAWARE

Entered June 22, 1904, at Newark, Delaware, as second-class matter, under Act of Congress of July 16, 1894

CATALOGUE

OF

DELAWARE COLLEGE

1917-1918

WITH

ANNOUNCEMENTS FOR 1918-1919

PUBLISHED BY THE COLLEGE

NEWARK, DELAWARE

1918

JANUARY

S	M	T	W	T	F	S
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SEPTEMBER

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OCTOBER

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DECEMBER

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CALENDAR

1918

January 3	Thursday	Christmas recess ends, 7.45 a. m.
January 17-26		Mid-Year Examinations
January 28	Monday	Second term begins, 7.45 a. m.
March 5	Tuesday	Meeting of the Trustees, 10.30 a. m.
March 28	Thursday	Easter recess begins, 4.25 p. m.
April 2	Tuesday	Easter recess ends, 7.45 a. m.
May 30	Thursday	Memorial Day: a holiday
June 3-7		Final Examinations
June 8	Saturday	Meeting of the Trustees, 10.30 a. m.
		Class Day
June 9	Sunday	Address—Young Men's Christian Association, 11.00 a. m.
		Baccalaureate Sermon, 8.00 p. m.
June 10	Monday	Commencement Day
June 12-13		Examinations for Admission

SUMMER VACATION

June 24	Monday	Summer School for Teachers opens.
August 30	Friday	Summer School for Teachers closes.
September 17-18		Examinations for Admission
September 19	Thursday	First term begins, 7.45 a. m.
November 26	Tuesday	Meeting of the Trustees, 10.30 a. m.

November 28	Thursday	Thanksgiving Day: a holiday
December 21	Saturday	Christmas recess begins, 12.15 p. m.
1919		
January 3	Friday	Christmas recess ends, 7.45 a. m.
January 16-25		Mid-Year Examinations
January 27	Monday	Second term begins, 7.45 a. m.
March 4	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 17	Thursday	Easter recess begins, 4.25 p. m.
April 22	Tuesday	Easter recess ends, 7.45 a. m.
May 30	Friday	Memorial Day: a holiday
June 2-6		Final Examinations
June 7	Saturday	Meeting of the Trustees, 10.30 a. m.
		Class Day
June 9	Monday	Commencement Day
June 11-12		Examinations for Admission

TRUSTEES OF DELAWARE COLLEGE

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The President of the State Board of Education, CLIFFORD J. SCOTT, Wilmington

The Master of the State Grange, HORACE L. DILWORTH, Centerville

The President of the College, SAMUEL CHILES MITCHELL

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J. HARVEY WHITEMAN, ESQ., Newark.....1892
CHARLES B. EVANS, ESQ., Newark.....1894
WILLIAM T. LYNAM, ESQ., Wilmington.....1897
CHARLES S. CONWELL, Camden.....1897
DANIEL W. CORBIT, Odessa.....1899
L. HEISLER BALL, M. D., Marshallton.....1900
W. WATSON HARRINGTON, ESQ., Dover.....1900
LEWIS W. MUSTARD, Lewes.....1900
SAMUEL H. MESSICK, Bridgeville.....1902
JAMES E. DUTTON, Seaford.....1904
JOHN BIGGS, ESQ., Wilmington.....1905
SAMUEL H. DERBY, Woodside.....1905
JOSEPH H. HOSSINGER, Newark.....1908
THOMAS DAVIS, ESQ., Wilmington.....1908
SAMUEL J. WRIGHT, Newark.....1910
EDWARD D. HEARNE, ESQ., Georgetown.....1910
HENRY RIDGELY, ESQ., Dover.....1911
CHARLES M. CURTIS, ESQ., Wilmington.....1911
EVERETT C. JOHNSON, Newark.....1911
HENRY B. THOMPSON, Greenville.....1912
EBEN B. FRAZER, Newark.....1913
H. RODNEY SHARP, Wilmington.....1915
W. H. HEALD, ESQ., Wilmington.....1915
HAMILTON M. BARKSDALE, Wilmington.....1915
CHARLES BARKER, Milford.....1916
EDWARD A. EVANS, Cheswold.....1916
CHARLES R. MILLER, Wilmington.....1917

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Samuel H. Messick, *Vice President*
Charles B. Evans, *Secretary and Treasurer*

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J. H. Hossinger
Henry Ridgely

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C. B. Evans
Clifford J. Scott

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Thomas Davis

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Edward Laurence Smith, A. M.
Dean, College—Modern Languages and Literatures
Merrill Van Giesen Smith, M.E. *Mechanical Engineering*
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Wilbur Owen Sypherd, Ph. D. *English*
Clarence Albert Short, S. M.
Mathematics and Engineering
Harry Hayward, S. M.
Dean, Agriculture—Animal Husbandry
Charles Andrew McCue, S. B. *Horticulture*
Arthur Elliott Grantham, A. B., S. B. *Agronomy*
Charles Lyndall Penny, A. M., Sc. D. *Chemistry*
Earnest Vancourt Vaughn, Ph. D.
History and Economics
Firman Thompson, S. B. *Chemistry*
Thomas Franklin Manns, Ph. D.
Plant Pathology and Soil Bacteriology
George Albert Koerber, E. E. *Electrical Engineering*
George Sylvester Counts, Ph. D.
Psychology and Education
Allan Reginald Cullimore, S. B.
Dean, Engineering—Civil Engineering
Fred Emerson Clark, Ph. D. *Business Administration*
Edward Palmer Pendleton, U. S. A.
Commandant of Cadets—Military Science and Tactics

Robert Vincent Mitchell, S. B. *Poultry Husbandry*
Charles Conger Palmer, S. M., D. V. M. *Bacteriology*
Howard Thomas Ruhl, A. M. *Agricultural Education*
George Elliott Dutton, A. M. *English*
Frank Alfred Hays, Ph. D. *Animal Husbandry*
Harold Edward Tiffany,* S. M. *Chemistry*
Zacharya Harry Srager, S. B.
Mechanical and Electrical Engineering
Arthur Craig Whittier,* S. B. *Agri. Chemistry*
Howard Kent Preston, C. E.
Mathematics and Engineering
Raymond Randal Pailthorp, S. B. *Horticulture*
Kent Roberts Greenfield, Ph. D. *History and Economics*
Mark Lovel Nichols, S. B. *Agronomy*
Charles Henry Rawlins, Jr., Ph. D. *Mathematics*
Claude Carl Spiker, A. M. *Modern Languages*
Alexander Graham McGougan, Ph. D. *Physics*
John Robert Moore, Ph. D. *English*
Robert Whitmore Goss, S. M. *Plant Pathology*
Reinhold Eugene Saleski, A. M. *Modern Languages*
Reeves Dyer String *Shop Work*
Finley Melville Kendall Foster, Ph. D. *English*
Stanwood Fulton Baumgartner, Ph. B.
Physical Director

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* Resigned.

EXPERIMENT STATION STAFF

Harry Hayward, S. M., Director
Charles A. McCue, S. B., Horticulturist
Arthur E. Grantham, A. B., S. B., Agronomist
Firman Thompson,* S. B., Chemist
Thomas F. Manns, Ph. D., Plant Pathologist
E. M. R. Lamkey, Ph. D., Plant Physiologist
C. E. Neff, A. M., Assistant Agronomist
W. J. Young, S. M., Assistant Horticulturist
D. C. Dyer, Ph. D., Chemist
H. T. King, S. B., Assistant Chemist
Robert W. Goss, S. M., Assistant Plant Pathologist
F. A. Hays, Ph. D., Animal Husbandman
C. C. Palmer, S. M., D. V. M., Bacteriology and Animal Hygiene
Phyllis Lapham, S. B., Research Assistant in Animal Husbandry
Helen Updegraff, S. M., Assistant Chemist

Marion C. Butterworth, A. B., Secretary
Esther Foster, Librarian
Florence E. Colbert, Stenographer for Agronomy Department
Alice Hoffecker, Stenographer for Horticultural Department
Marion C. Brown, Stenographer for Extension Staff
Helen Slack, Stenographer

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* Resigned, January, 1918.

AGRICULTURAL EXTENSION

Harry Hayward, S. M., Director

Gertrude L. Blodgett, S. B., State Leader of Home Demonstration Agents

Theodore T. Martin, A. B., S. B., Boys' and Girls' Club Leader

M. O. Pence, S. B., State Leader of County Agents

Agnes P. Medill, Assistant State Leader of Boys' and Girls' Club Work

R. V. Mitchell, S. B., State Poultry Demonstrator

Morris Zurkow, V. M. D., Specialist in Hog Cholera. Assigned by the Bureau of Animal Industry, U. S. Department of Agriculture

COUNTY AGENTS

R. O. Bausman, S. B., New Castle County

D. H. Kauffman, S. B., Sussex County

H. H. Zimmerley, S. B., Kent County

HOME DEMONSTRATION AGENTS

Amelia Doddridge, S. B., City of Wilmington

Ethel M. Dole, S. M., Kent County

C. Eva Miller, S. M., Sussex County

Clara M. Nixon, S. B., Poultry Specialist, Sussex County

DELAWARE COLLEGE

COURSES OF INSTRUCTION

The following Courses of Instruction are offered by Delaware College:

I **Arts and Science,** a four years' course, leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Agriculture,** a four years' course, leading to the degree of Bachelor of Science.

III **Engineering**—Civil, Mechanical, Electrical, and Chemical, four years' courses, leading to the degree of Bachelor of Science.

Tuition is free to all students from the State of Delaware. The college constitutes a part of our system of free public instruction. In its scheme of education, the culture of liberal learning and the practical usefulness of the applied sciences are equally emphasized.

The Women's College of Delaware

Affiliated with Delaware College is the Women's College of Delaware, established by the State in September, 1914. The college offers four courses of instruction leading to degrees:

I **Arts and Science,** a four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Education,** a four years' course leading to the degree of Bachelor of Science.

III **Home Economics,** a four years' course leading to the degree of Bachelor of Science.

IV **Agriculture,** a four years' course leading to the degree of Bachelor of Science.

In addition to these regular courses, two years' courses in Education and in Home Economics are offered to students who are qualified to do the work. Tuition is free to students from the State of Delaware. Information in regard to the college may be obtained from the Dean of the Women's College.

Summer School

For the benefit of teachers and others who are qualified to do the work, a Summer School is held each summer at Delaware College. The session of 1918 will open on June 24 and close on August 30. The expenses of teachers from Delaware are paid by the State. For information in regard to the School, write to Professor George S. Counts, Delaware College, Newark, Delaware.

REQUIREMENTS FOR ADMISSION

Students are admitted either upon examination at the college or upon certificates from accredited schools or from other colleges or universities. Examinations are held in June and September according to the schedule on page 16. Certificates from schools should be presented as early as possible during the summer preceding the session of the college which students wish to attend. Blank certificates may be had upon application.

GENERAL REGULATIONS

Candidates for admission to the Freshman class must be at least 16 years of age and of good moral character.

Every candidate for admission must have completed a four-year high school course or its equivalent.

Candidates wishing to receive entrance credits on subjects not offered in the schools from which they present certificates are required to take examinations in such subjects on days prescribed in the Calendar of the college.

Students should enter at the **beginning of the first term,** because the subjects which are begun at that time are not repeated in the second term.

Students will not be permitted to enter the college in the first term after October 15, unless they have completed an amount of work equivalent to the work already done by the classes which they wish to enter.

SPECIFIC REQUIREMENTS

Fourteen units are required for admission to all courses leading to degrees. No student will be admitted with more than two conditions.

The term **unit** means the equivalent of five recitations

a week for one year in one subject.

The following units are required of all:

English	3	units
Mathematics (Plane Geometry and Algebra)	2½	"
Modern Language	2	"
History	1	unit
Science	1	"
Total	9½	units

Additional units to the number of 4½ must be offered from the following list.

Mathematics	
Solid Geometry	½ unit
Foreign Languages	
Greek	1, 2, 3, or 4 units
Latin	1, 2, 3, or 4 units
German	1, 2, 3, or 4 units
French	1, 2, 3, or 4 units
History	
Ancient	1 unit
Mediaeval and Modern	1 unit
English	1 unit
United States	½ or 1 unit
Civics	½ unit
Science	
Botany	½ or 1 unit
Chemistry	1 unit
Physics	1 unit
Physical Geography	½ or 1 unit
Physiology	½ unit
Zoology	½ or 1 unit
Vocational Subjects	Units to be determined

Arts and Science

In addition to the 9½ units required of all, candidates may offer any of the subjects in the foregoing list in order to make fourteen units. Candidates for the degree of A. B. must offer four units of Latin or Greek, or take a condition in the subject not exceeding 2 units.

Agriculture

In addition to the 9½ units required of all, candidates must select 4½ units from the foregoing list of elective subjects.

Engineering

In addition to the 9½ units required of all, candidates must offer 4½ additional units, including Solid Geometry (½ unit). The required science for candidates for admission to courses in Engineering is Physics. Students who have to take in college the additional course in Solid Geometry or an extra year in Modern Languages will find it difficult to finish the course in Engineering in four years. No student will be admitted to a course in Engineering who has not satisfied completely the entrance requirements in Mathematics.

Note 1. All candidates for admission are examined in English Composition in order to test their ability to do the required English of the Freshman year. Examinations are held in June and September. Candidates are advised to take the examination in June. Those who fail will have the opportunity of working privately on the subject during the summer or of taking a course in English in the six weeks' Summer Session.

Note 2. Units in vocational subjects to the number of three will be accepted from graduates of the four-year

Smith-Hughes High School Course. Graduates of this course may also substitute two other units for the regular entrance requirement in Modern Language.

ADMISSION TO ADVANCED STANDING

Candidates for entrance to an advanced class in any of the courses are required either to sustain examinations in all studies of the courses up to the point at which they seek admission, or to present from other colleges certificates covering such studies.

ENTRANCE EXAMINATIONS

Entrance examinations will be held at the college in Newark on Wednesday and Thursday, June 12 and 13, 1918, beginning at 9 a. m.; also on Tuesday and Wednesday, September 17 and 18, 1918, at the same hours.

Ancient History or English History—9.00-10.30, Wednesday, June 12, and Tuesday, September 17.

Algebra—10.30-12.30, Wednesday, June 12, and Tuesday, September 17.

Geometry—1.30-3.00, Wednesday, June 12 and Tuesday, September 17.

Latin—3.15-4.30, Wednesday, June 12, and Tuesday, September 17.

Greek and Physics—9.00-10.30, Thursday, June 13, and Wednesday, September 18.

English—10.30-12.30, Thursday, June 12, and Wednesday, September 18.

History of the United States and Civil Government—1.15-2.45, Thursday, June 12, and Wednesday, September 18.

Solid Geometry—2.45-4.30, Thursday, June 12, and Wednesday, September 18.

Hours for examinations in other subjects will be arranged for with the candidates who offer such subjects.

COURSE IN ARTS AND SCIENCE

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 128 credit term-hours of work in addition to Military Science and Physical Training. Graduates from the course in Arts and Science who have offered for admission four years of Latin or Greek, or who have completed in college an equivalent amount of work will receive the degree of Bachelor of Arts; all other graduates will receive the degree of Bachelor of Science.

Prescribed Studies

	Term Hours	Credits
English	16	16
Mathematics	8	8
Modern Language	12	12
Science (Chemistry, Zoology, Botany, or Physics)	12	12
History and Economics	12	12
	60	60
Military Drill	12	6
Physical Training	4	2

FRESHMAN YEAR

First Term	H.*	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Mathematics, 1, 2	4	4	Mathematics, 3, 4	4	4
Language—Latin, French, or German	3	3	Language—Latin, French, or German	3	3
History, 1	3	3	History, 1	3	3
Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6	Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6
Military Science, 1	3	1.5	Military Science, 1	3	1.5
Physical Training, 1	1	0.5	Physical Training, 1	1	0.5

* The capital letters H. and C. refer to Actual Hours and Credit Hours respectively.

SOPHOMORE, JUNIOR, AND SENIOR YEARS

At the beginning of the Sophomore year, every candidate for the degree of Bachelor of Arts or Bachelor of Science shall select from the following groups a major study, in which he shall complete thereafter 18 hours of work. In addition, he must take from the group from which he selects his major at least one additional course after the Freshman year.

During these three years students must take in addition to the required work in Military Science and Physical Training all prescribed subjects not completed in the Freshman year and elective courses sufficient to make a total of thirty credit term-hours each year.

Group A

Greek	English
Latin	History and Economics
German	Business Administration
French	Education and Psychology

Group B

Biology Chemistry

Mathematics and Physics

COURSE IN AGRICULTURE

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 138 credit term-hours of work in addition to military science and physical training.

Candidates for a degree in Agriculture may choose at the beginning of the Junior year, either Agronomy, Animal Husbandry, Horticulture, or Poultry Husbandry for a major course. A minimum of 28 credit hours must be taken in the department in which the student is majoring.

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Biology, 1	5	3	Biology, 1	5	3
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
Biology, 4	5	3	Biology, 4	5	3
Agronomy, 1	4	3	Horticulture, 1	4	3
Animal Husbandry, 1	4	3	Elective Agriculture		3
Military Science, 1	3	1.5	Military Science, 2	3	1.5
Physical Training, 1	1	0.5	Physical Training, 1	1	0.5

SOPHOMORE YEAR

History, 2	1	1	English, 2	2	2
English, 2	2	2	Chemistry, 2	5	3
Chemistry, 2, 4	6	4.5	Chemistry, 18	9	5
Physics, 1, 2	6	4.5	Agronomy, 4	5	3
Horticulture, 3	4	3	Poultry Husbandry, 2	4	3
Animal Husbandry, 2	4	3	Elective Agriculture		3
Poultry Husbandry, 1	2	1	Military Science, 4	3	1.5
Military Science, 3	3	1.5	Physical Training, 2	1	0.5
Physical Training, 2	1	0.5			

JUNIOR YEAR

History, 12	3	3	History, 8	3	3
Bacteriology, 1	5	3	Bacteriology, 1	5	3
Agronomy, 5	5	3	Animal Hygiene, 1 or		
Horticulture, 14	3	3	Plant Pathology, 1	5	3
Electives		6	Electives		9
Elective			*Elective*		
Military Science, 5	5	2.5	Military Science, 6	5	2.5

SENIOR YEAR

History, 13	3	3	Agronomy, 7	5	3
Seminar	1	1	Seminar	1	1
Electives		14	Electives		14
Elective			*Elective*		
Military Science, 7	5	2.5	Military Science, 8	5	2.5

COURSES IN ENGINEERING

CIVIL ENGINEERING

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Mathematics, 16	4	4	Mathematics, 17	4	4
Civil Engineering, 34	2	1	Civil Engineering, 34	2	1
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
Mechanical Engineering, 20	4	2	Mechanical Engineering, 20	4	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
Military Science, 1	3	1.5	Military Science, 2	3	1.5
Physical Training, 1	1	0.5	Physical Training, 1	1	0.5

Note: Freshmen and Sophomores are required to attend the summer school of Surveying, which will be held during the two weeks immediately after the close of college in June.

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Physics, 3	5	5	Physics, 3	5	5
Physics, 4	3	1.5	Physics, 4	3	1.5
Civil Engineering, 15	4	3	Civil Engineering, 15	4	3
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 22	3	1.5
History, 3	3	3	History, 3	3	3
Military Science, 3	3	1.5	Military Science, 4	3	1.5
Physical Training, 2	1	0.5	Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 8	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 11	5	5
Mineralogy, 1	3	3	Mineralogy, 2	3	3
Hygiene, 2	1	1	Hygiene, 2	2	1
Civil Engineering, 32	2	1	Civil Engineering, 32	2	1
Civil Engineering, 6	3	3	Civil Engineering, 13	3	3
Civil Engineering, 16	5	3.5	Civil Engineering, 16	7	5.5
Electrical Engineering, 11	2	2	Mechanical Engineering, 1	3	3
Elective			*Elective*		
Military Science, 5	5	2.5	Military Science, 6	5	2.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 1			Civil Engineering, 1		
Civil Engineering, 3	4	4	Civil Engineering, 3	4	4
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Civil Engineering, 33	3	1.5	Business Administration, 5	3	3
Business Administration, 3	3	3	*Elective*		
Elective			Military Science, 8	5	2.5
Military Science, 7	5	2.5			

Structural

Civil Engineering, 12	5	5	Civil Engineering, 31	8	6

Municipal

Civil Engineering, 11	5	5	Civil Engineering, 10	4	4
			Civil Engineering, 37	5	2.5

Highway

Civil Engineering, 8	4	4	Civil Engineering, 8	4	4
			Civil Engineering, 38	5	2.5

Railroad

Civil Engineering, 9	4	4	Civil Engineering, 9	4	4
			Civil Engineering, 39	5	2.5

MECHANICAL AND ELECTRICAL ENGINEERING

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 1 or 10	3	3	Modern Language, 1 or 10	3	3
Mathematics, 16	4	4	Mathematics, 17	4	4
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
Civil Engineering, 34	2	1	Civil Engineering, 34	2	1
Mechanical Engineering, 20	4	2	Mechanical Engineering, 20	4	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
History, 2	1	1	Military Science, 2	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	–
Physical Training, 1	1	–			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 2	2	2	English, 2	2	2
Modern Language, 2 or 11	3	3	Modern Language, 2 or 11	3	3
Business Admin., 3	3	3	Business Admin., 5	3	3
Mathematics, 6	4	4	Mathematics, 7	4	4
Physics, 3	5	5	Physics, 3	5	5
Physics, 4	3	1.5	Physics, 4	3	1.5
Mechanical Engineering, 22	3	1.5	Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 41	3	1.5	Mechanical Engineering, 23	3	1.5
Mechanical Engineering, 43	–	3	Mechanical Engineering, 41	3	1.5
Military Science, 3	3	1.5	Military Science, 4	3	1.5
Physical Training, 2	1	–	Physical Training, 2	1	–

JUNIOR YEAR

First Term	H.	C.
Mathematics, 8	3	3
Mathematics, 11	5	5
Civil Engineering, 32	2	1
Civil Engineering, 6	3	3
Mechanical Engineering, 24	4	4
Mechanical Engineering, 42	3	1.5
Electrical Engineering, 1	2	2
Electrical Engineering, 30	3	1.5
Elective		
Military Science, 5	5	2.5

Second Term	H.	C.
Mathematics, 8	3	3
Mathematics, 11	5	5
Civil Engineering, 32	2	1
Mechanical Engineering 1	3	3
Mechanical Engineering, 24	4	4
Mechanical Engineering, 42	3	1.5
Electrical Engineering, 2	2	2
Electrical Engineering, 30	3	1.5
Elective		
Military Science, 6	5	2.5

SENIOR YEAR—MECHANICAL ENGINEERING

First Term	H.	C.
English, 7	1	1
Civil Engineering, 4	4	4
Mechanical Engineering, 3	2	2
Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1
Mechanical Engin er-ing, 9	1	1
Mechanical Engineering, 25	6	3
Mechanical Engineering, 30	6	3
Electrical Engineering, 3	5	5
Electrical Engineering, 32	3	1.5
Elective		
Military Science, 7	5	2.5

Second Term	H.	C.
English, 7	1	1
Civil Engineering, 4	4	4
Mechanical Engineering, 3	2	2
Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1
Mechanical Engineering, 9	1	1
Mechanical Engineering, 25	6	3
Mechanical Engineering, 30	6	3
Electrical Engineering, 3	5	5
Electrical Engineering, 32	3	1.5
Elective		
Military Science, 8	5	2.5

SENIOR YEAR—ELECTRICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 7	1	1
Civil Engineering, 4	4	4	Civil Engineering, 4	4	4
Mechanical Engineering, 4	4	4	Mechanical Engineering, 4	4	4
Mechanical Engineering, 6	1	1	Mechanical Engineering, 6	1	1
Mechanical Engineering, 31	3	1.5	Mechanical Engineering, 31	3	1.5
Electrical Engineering, 3	5	5	Electrical Engineering, 3	5	5
Electrical Engineering, 5	2	2	Electrical Engineering, 5	2	2
Electrical Engineering, 20	6	3	Electrical Engineering, 20	6	3
Electrical Engineering, 31	6	3	Electrical Engineering, 31	6	3
Elective			*Elective*		
Military Science, 7	5	2.5	Military Science, 8	5	2.5

CHEMICAL ENGINEERING

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 1	3	3
Modern Language, 10	3	3	Modern Language, 10	3	3
Mathematics, 16	4	4	Mathematics, 17,	4	4
Mechanical Engineering, 20	4	2	Mechanical Engineering, 20	4	2
Mechanical Engineering, 21	3	1.5	Mechanical Engineering, 21	3	1.5
Mechanical Engineering, 40	3	1.5	Mechanical Engineering, 40	3	1.5
Chemistry, 1	5	3.5	Chemistry, 1, 3	5	3.5
History, 2	1	1	Military Science, 2	3	1.5
Military Science, 1	3	1.5	Physical Training, 1	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.
English, 2	2	2
Modern Language, 11	3	3
Mathematics, 6	4	4
Physics, 3	5	5
Physics, 4	3	1.5
Chemistry, 2	3	3
Chemistry, 4	3	1.5
Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 44	3	1.5
Mechanical Engineering, 43	–	3
Military Science, 3	3	1.5
Physical Training, 2	1	0.5

Second Term	H.	C.
English, 2	2	2
Modern Language, 11	3	3
Mathematics, 6	4	4
Physics, 3	5	5
Physics, 4	3	1.5
Chemistry, 2	3	3
Chemistry, 6	3	1.5
Mechanical Engineering, 22	3	1.5
Mechanical Engineering, 23	3	1.5
Military Science, 4	3	1.5
Physical Training, 2	1	0.5

JUNIOR YEAR

First Term	H.	C.
Mathematics, 8	3	3
Mathematics, 11	5	5
Chemistry, 5	3	3
Chemistry, 7	6	3
Chemistry, 9	1	1
Chemistry, 11	3	1.5
Mineralogy, 1	3	3
Electrical Engineering, 1	2	2
Elective		
Military Science, 5	5	2.5

Second Term	H.	C.
Mathematics, 8	3	3
Mathematics, 11	5	5
Chemistry, 5	3	3
Chemistry, 7	6	3
Chemistry, 9	1	1
Mineralogy, 2	3	3
Mechanical Engineering, 1	3	3
Electrical Enginnering, 2	2	2
Elective		
Military Science, 6	5	2.5

SENIOR YEAR

First Term	H.	C.
English, 7	1	1
Chemistry, 8	3	3
Chemistry, 10	12	6
Chemistry, 13	2	1
Chemistry, 15	3	3
Chemistry, 17	3	3
Elective		
(From non-technical subjects)	3	3
Military Science, 7	5	2.5

Second Term	H.	C.
English, 7	1	1
Chemistry, 10	12	6
Chemistry, 12	4	2
Chemistry, 14	2	1
Chemistry, 15	3	3
Chemistry, 17	3	3
Elective		
(From non-technical subjects)	3	3
Military Science, 8	5	2.5

SUBJECTS OF INSTRUCTION

By Departments

In this detailed statement of the subjects of instruction, the number of credit term-hours is printed in italics at the end of each course.

Two hours of laboratory work are counted as equivalent to one lecture or recitation hour.

Courses that will not be given in 1918-1919 are marked with an asterisk.

AGRONOMY

Professor Grantham and Assistant Professor Nichols

Ag	1	Field Crop Production. First term.	*Three credit hours*
Ag	2	Cereal Crops. Second term.	*Three credit hours*
Ag	3	Forage Crops. Second term.	*Three credit hours*
Ag	4	Soil Physics. Second term.	*Three credit hours*
Ag	5	Soil Fertility. First term.	*Three credit hours*
Ag	6	Farm Equipment. First term.	*Three credit hours*
Ag	7	Farm Management. Second term.	*Three credit hours*
Ag	8	Plant Breeding. Second term.	*Two credit hours*
Ag	9	Advanced Soils. First term.	*Three credit hours*
Ag	10	Methods of Field Experimentation.	*Two credit hours*
Ag	11	Land Drainage. Second term.	*Two credit hours*
Ag	12	Farm Power. First term.	*Three credit hours*
Ag	13	Thesis and Seminar.	*Three credit hours*

ANCIENT LANGUAGES AND LITERATURE

PROFESSOR CONOVER

AL 1		*Six credit hours*
AL 2		*Six credit hours*
AL 3		*Six credit hours*
AL 5		*Six credit hours*
AL 6		*Six credit hours*
AL 7		*Six credit hours*
AL 10		*Four credit hours*

ANIMAL HUSBANDRY

PROFESSOR HAYWARD AND ASSOCIATE PROFESSOR HAYS

AH 3	Stock Feeding. Second term.	*Three credit hours*
AH 4	Live Stock Management. First term.	*Three credit hours*
AH 5	Advanced Judging. Second term.	*Two credit hours*
AH 6	Dairy Cattle Management. Second term.	*Three credit hours*
AH 7	Animal Breeding. Second term.	*Three credit hours*
AH 8	Animal Nutrition. First term.	*Three credit hours*
AH 9	Seminar. First term.	*One credit hour*
AH 10	Pedigree Studies. Second term.	*Three credit hours*
AH 11	Seminar. Second term.	*One credit hour*
AH 12	Creamery Work. Second term.	*Three credit hours*
AH 13	Thesis. Second term.	*Two credit hours*
AH 14	Horse, Swine, Sheep, and Dairy Cattle Problems. Second term.	*Four credit hours*

BACTERIOLOGY, PHYSIOLOGY, AND HYGIENE

PROFESSOR PALMER

Ba 1 General Bacteriology. *Six credit hours*

Ba 2 Advanced Bacteriology. First term. *Three credit hours*

Phy 1 General Physiology. First term. *Three credit hours*

Phy 2 Advanced Physiology. Second term. *Three credit hours*

Hyg 1 Animal Hygiene and Pathology. Second term. *Three credit hours*

Hyg 2 Hygiene and Sanitation *Two credit hours*

BIOLOGY

PROFESSOR HOUGHTON

B 1 Elementary Zoology. *Six credit hours*

B 2 Systematic and Economic Zoology. *Four credit hours*

B 3 Economic Entomology. *Four credit hours*

B 4 General Botany. *Six credit hours*

BUSINESS ADMINISTRATION

PROFESSOR CLARK

Principles of Economics. (See History 10 and 11). Students majoring in Business Administration must take this course before their Senior year. First and second terms. *Six credit hours*

Business 1 Accounting. *Six credit hours*

Business 2* Business Organization. First term. *Three credit hours*

Business 3 Business Management. First term. *Three credit hours*

Business 4 Markets and Marketing Methods. Second term. *Three credit hours*

Business 5 Railway Transportation. Second term. *Three credit hours*

Business 6 Business Finance. First term. *Three credit hours*

CHEMISTRY

PROFESSOR PENNY AND PROFESSOR THOMPSON

C 1 Inorganic Chemistry.
Three and one-half, and two, credit hours

C 2 Organic Chemistry. *Six credit hours*

C 3 Introductory Qualitative Analysis.
One and one-half credit hours

C 4 Introductory Quantitative Analysis.
One and one-half credit hours

C 5 Agricultural Chemistry. *Six credit hours*

C 6 Qualitative Analysis. *One and one-half credit hours*

C 7 Quantitative Analysis. *Three credit hours*
(In 1919 and thereafter, six credit hours)

C 8 Industrial Chemistry. *Three credit hours*

C 9 Chemical Calculations. *Two credit hours*

C 10 Technical Analysis. *Twelve credit hours*

C 11 Organic Analysis and Organic Preparations.
One and one-half credit hours

C 12 Water Analysis. *Two credit hours*

C 13 Gas Analysis. *One credit hour*

C 14 Electro-analysis. *One credit hour*

C 15 Electrochemistry. *Six credit hours*

C 16 Thesis.

C 17 General and Physical Chemistry. *Six credit hours*

C 18 Agricultural Chemistry. *Five credit hours*

C 19 Agricultural Chemistry. First term.
Three credit hours

C 20 Agricultural Chemistry. Second term.
Three credit hours

CIVIL ENGINEERING

PROFESSOR CULLIMORE, PROFESSOR SHORT, AND ASSISTANT PROFESSOR PRESTON

CE 1	Thesis.	
CE 3	Hydromechanics.	*Eight credit hours*
CE 4	Mechanics of Materials.	*Eight credit hours*
CE 6	Building Construction. First term.	*Three credit hours*
CE 8	Highways.	*Eight credit hours*
CE 9	Railroads.	*Eight credit hours*
CE 10	Water Supply. Second term.	*Four credit hours*
CE 11	Sewerage. First term.	*Five credit hours*
CE 12	Structures. First term.	*Five credit hours*
CE 13	Framed Structures. Second term.	*Three credit hours*
CE 15	Surveying.	*Six credit hours*
CE 16	Advanced Surveying.	*Nine credit hours*
CE 31	Structural Design. Second term.	*Four credit hours*
CE 32	Graphic Statics.	*Two credit hours*
CE 33	Engineering Laboratory. First term.	*One and one-half credit hours*
CE 34	Elementary Surveying.	*Two credit hours*
CE 37	Hydraulic Design. Second term.	*Two and one-half credit hours*
CE 38	Highway Design. Second term.	*Two and one-half credit hours*
CE 39	Railroad Design. Second term.	*Two and one-half credit hours*

EDUCATION AND PSYCHOLOGY

PROFESSOR COUNTS AND PROFESSOR RUHL

Ed 1	Introduction to Education. Second term.	*Three credit hours*
Ed 2	Introductory Psychology. Second term.	*Three credit hours*
Ed 3	Ethics.*	*Three credit hours*
Ed 4	Rural Education. First term.	*Three credit hours*
Ed 5	The High School Curriculum. Second term.	*Three credit hours*
Ed 6	Experimental Education. First term.	*Three credit hours*
Ed 7	Special Method and Practice in Agriculture.	*Six credit hours*

ELECTRICAL ENGINEERING

PROFESSOR KOERBER

EE 1	Direct Currents. First term.	*Two credit hours*
EE 2	Direct Currents. Second term.	*Two credit hours*
EE 3	Alternating Currents.	*Ten credit hours*
EE 5	Direct Currents.	*Four credit hours*
EE 11	Direct Currents. First term.	*Two credit hours*
EE 20	Electrical Design.	*Six credit hours*
EE 30	Electrical Laboratory.	*Three credit hours*
EE 31	Electrical Laboratory.	*Six credit hours*
EE 32	Electrical Laboratory.	*Three credit hours*

ENGLISH

PROFESSOR SYPHERD, ASSOCIATE PROFESSOR DUTTON, ASSISTANT PROFESSOR MOORE, AND DR. FOSTER

E	1	Composition.	*Six credit hours*
E	2	Literature.	*Four credit hours*
E	3*	Literature. First term.	*Three credit hours*
E	4*	Literature. Second term.	*Three credit hours*
E	5*	Literature. Second term.	*Three credit hours*
E	6	American Literature.	*Six credit hours*
E	7	Composition. Engineering.	*Two credit hours*
E	8	Advanced Composition. First term.	*Three credit hours*
E	9	Composition and Literature.	*Six credit hours*
E	10	Composition. Agriculture.	*Two credit hours*
E	11	Modern Drama	*Six credit hours*
E	12*	Anglo-Saxon. Second term.	*Two credit hours*
E	13	Literature. Sophomores in Arts and Science.	*Six credit hours*
E	14	Debating.	*Two credit hours*
E	15	Shakspere. First term.	*Three credit hours*
E	16*	The English Bible. Second term.	*Three credit hours*

HISTORY, ECONOMICS, AND GOVERNMENT

PROFESSOR VAUGHN AND ASSISTANT PROFESSOR GREENFIELD

H	1	European History.	*Six credit hours*
H	2	History and Government of Delaware. First term.	*One credit hour*
H	3	History of the United States.	*Six credit hours*
H	4	History of England.	*Six credit hours*
H	5	French Revolution and Napoleonic Era. First term.	*Three credit hours*

H 6 Europe Since 1815. Second term. *Three credit hours*

H 7 Introduction to the Study of Society. First term. *Three credit hours*

H 8 Practical Sociology. Second term. *Three credit hours*

H 9 Rural Sociology. First term. *Three credit hours*

H 10 Principles of Economics. First term. *Three credit hours*

H 11 Economic Problems. Second term. *Three credit hours*

H 12 Agricultural Economics. First term. *Three credit hours*

H 13 American Government. *Six credit hours*

H 14 Political Parties and Practical Politics. First term. *Three credit hours*

H 15 The United States as a World Power. Second term. *Three credit hours*

H 16 Studies in Delaware History. *Four or six credit hours*

H 17 Contemporary Problems. *Four or six credit hours*

HORTICULTURE

Professor McCue and Assistant Professor Pailthorp

Hort 1 Plant Propagation. Second term. *Three credit hours*

Hort 2 Vegetable Gardening. Second term. *Three credit hours*

Hort 3 Pomology. First term. *Three credit hours*

Hort 4 Pomology. Second term. *Three credit hours*

Hort 5 Forestry. First term. *Two credit hours*

Hort 6 Landscape Gardening. Second term. *Three credit hours*

Hort 7 Advanced Pomology. First term. *Three credit hours*

Hort 8	Breeding of Horticultural Plants. Second term.	*Three credit hours*
Hort 9	Forcing Crops. Second term.	*Three credit hours*
Hort 10	Small Fruits. Second term.	*Three credit hours*
Hort 11	Systematic Pomology. First term.	*Three credit hours*
Hort 12	Seminar. First term.	*One credit hour*
Hort 13	Seminar. Second term.	*One credit hour*
Hort 14	Genetics. First term.	*Three credit hours*

MATHEMATICS

PROFESSOR HARTER, PROFESSOR SHORT, ASSISTANT PROFESSOR PRESTON, AND ASSISTANT PROFESSOR RAWLINS

M 1	Solid Geometry. First term.	*Two credit hours*
M 2	Plane Trigonometry. First term.	*Two credit hours*
M 3	Spherical Trigonometry. Second term.	*One credit hour*
M 4	College Algebra. Second term.	*Three credit hours*
M 6	Analytic Geometry. First term.	*Four credit hours*
M 7	Calculus. Second term.	*Four credit hours*
M 8	Calculus and Differential Equations.	*Six credit hours*
M 9	General Astronomy.	*Four credit hours*
M 11	Theoretical Mechanics.	*Ten credit hours*
M 14	Method of Least Squares. First term.	*Two credit hours*
M 16	Plane Trigonometry and Algebra. First term.	*Four credit hours*
M 17	Spherical Trigonometry and Algebra. Second term.	*Four credit hours*

MECHANICAL ENGINEERING

PROFESSOR SMITH, ASSISTANT PROFESSOR SRAGER, AND MR. STRING

ME 1	Elements of Steam Engineering. Second term.	*Three credit hours*
ME 3	Thermodynamics.	*Four credit hours*
ME 4	Steam Engines and Boilers.	*Eight credit hours*
ME 6	Gas Engines.	*Two credit hours*
ME 9	Steam Turbines.	*Two credit hours*
ME 20	Descriptive Geometry.	*Four credit hours*
ME 21	Mechanical Drawing.	*Three credit hours*
ME 23	Mechanical Drawing. Second term.	*One and one-half credit hours*
ME 24	Kinematics.	*Eight credit hours*
ME 25	Machine Design.	*Six credit hours*
ME 30	Experimental Engineering.	*Six credit hours*
ME 31	Experimental Engineering.	*Three credit hours*
ME 40	Carpentry and Wood Turning.	*Three credit hours*
ME 41	Metal Work and Forging.	*Three credit hours*
ME 42	Pattern Making and Founding.	*Three credit hours*
ME 43	Supplementary Term Shopwork. June 13 to June 27, inclusive.	*Three credit hours*
ME 44	Metal Work and Forging. First term.	*One and one-half credit hours*

MILITARY SCIENCE AND TACTICS

COLONEL E. P. PENDLETON, U. S. A., RETIRED

FRESHMAN YEAR

Mil 1	Three hours
Mil 2	Three hours

SOPHOMORE YEAR

Mil 3	Three hours
Mil 4	Three hours

JUNIOR YEAR

Mil 5	Five hours
Mil 6	Five hours

SENIOR YEAR

Mil 7	Five hours
Mil 8	Five hours

MINERALOGY AND GEOLOGY

PROFESSOR PENNY

Mi 1	Mineralogy.	*Three credit hours*
Mi 2	Geology.	*Three credit hours*

MODERN LANGUAGES AND LITERATURES

PROFESSOR E. L. SMITH, ASSISTANT PROFESSOR SPIKER, AND ASSISTANT PROFESSOR SALESKI

FRENCH

ML 1	Elementary French.	*Six credit hours*
ML 2	Advanced French.	*Six credit hours*
ML 3	General Survey of French Literature.	*Six credit hours*
ML 4	Nineteenth Century.	*Six credit hours*

SPANISH

ML 5	Elementary Spanish.	*Six credit hours*
ML 6	Advanced Spanish.	*Six credit hours*

ITALIAN

ML 7	Elementary Italian.	*Six credit hours*
ML 8	Advanced Italian.	*Six credit hours*

GERMAN

ML 9	Elementary German.	*Six credit hours*
ML 10	Prose Readings and Composition.	*Six credit hours*
ML 11	Advanced German.	*Six credit hours*
ML 12	Classical Period.	*Six credit hours*
ML 13	German Novel.	*Six credit hours*

PHYSICAL TRAINING

PHYSICAL DIRECTOR BAUMGARTNER

PT 1	One hour
PT 2	One hour

PHYSICS

PROFESSOR HARTER AND ASSISTANT PROFESSOR MCGOUGAN

Ps 1	General Physics.	*Six credit hours*
Ps 2	Laboratory Physics.	*Three credit hours*
Ps 3	General Physics.	*Ten credit hours*
Ps 4	Laboratory Physics.	*Three credit hours*
Ps 5	Advanced Physics.	*Three and one-half credit hours*

PLANT PATHOLOGY AND SOIL BACTERIOLOGY

PROFESSOR MANNS AND ASSISTANT PROFESSOR GOSS

Pl 1	Plant Pathology. Second term.	*Three credit hours*
SB 1	Soil Bacteriology. Second term.	*Three credit hours*

POULTRY HUSBANDRY

PROFESSOR MITCHELL

PH 1	Breeds of Poultry. First term.	*One credit hour*
PH 2	Elements of Poultry Husbandry. Second term.	*Three credit hours*
PH 3	Poultry Judging. Second term.	*Two credit hours*
PH 4	Housing and yards. First term.	*Three credit hours*
PH 5	Incubation and Brooding. Second term.	*Three credit hours*

PH 6 Incubation and Brooding Practice. Second term. *Two credit hours*
PH 7 Poultry Feeding. Second term. *Three credit hours*
PH 8 Fattening and Dressing. First term. *Three credit hours*
PH 9 Markets and Marketing. First term. *Three credit hours*
PH 10 Sanitation and Diseases. *Two credit hours*
PH 11 Poultry Management. Second term. *Five credit hours*
PH 12 Review of Poultry Literature. Second term. *Two credit hours*

GENERAL INFORMATION

EXPENSES

Tuition

Tuition is free to students from the State of Delaware. The tuition for all other students is $25 a term, or $50 for the year.

Fees

	First Term	*Second Term*
INCIDENTAL EXPENSES	$25.00	$25.00
Use of Library		
Use of Gymnasium		
Athletics		
Infirmary		
Ordinary "wear and tear"		
LABORATORY		
Shop		
Freshman year	3.75	3.75
Sophomore year	5.25	5.25
Junior year	3.75	3.75
Chemistry	7.50	7.50
Zoology	1.25	1.25
Botany	1.25	1.25

Bacteriology	2.50	2.50
Electrical Engineering		
Junior year	6.00	6.00
Senior year	6.00	6.00

MATRICULATION

A fee of $5.00 is charged to each student on entering college. This fee is collected but once.

Rooms and Board

Rooms. The New College Dormitory, Harter Hall, accommodates 59 students. The four Fraternity houses accommodate about 70 students. Other students may obtain rooms in the town. All Freshmen are required to live in the Dormitories. The College plans to house in dormitories to be erected all resident students who do not live in the Fraternity houses or in their own homes.

Rooms in Harter Hall are of two classes, single and en suite. There are 37 single rooms, and 11 suites consisting of a study room and two bedrooms. The College provides for each student a bed, chiffonier, study table, and two chairs. Other furnishings, including bed clothes and linen, must be provided by the student. All rooms are heated with steam and lighted with electricity.

Applications for rooms for 1918-1919 should be made to Mr. William Langhorne, Secretary of Business Administration. Rooms must be engaged for the entire year. Proportionate deductions will be made in the case of students who leave college during the year. A deposit of $5.00 must be made when a room is rented.

Prices for rooms, including heat, light, and janitor service, range from $50 to $80 for each student.

Board. ALL RESIDENT STUDENTS, EXCEPT THOSE WHO LIVE IN THEIR OWN HOMES, ARE REQUIRED TO BOARD IN THE COLLEGE DINING HALL. Meals will be furnished at cost, the estimated

price per week being $5.50. The actual cost may be slightly above this figure.

Estimated Total Expenses

The usual expenses for the year of a Freshman from the State of Delaware who boards in Newark may be estimated approximately as follows:

Matriculation	$ 5.00
Incidental expenses	50.00
Board, 38 weeks at $5.50	209.00
Room	55.00
Books	12.00
Laundry	18.00
Uniform	12.00
Other incidentals (personal expenses)	25.00
Total	$386.00

For a student in Agriculture, $2.50 should be added for charges in Botanical Laboratory. For a student in Engineering, approximately $25 should be added for draughting instruments and Shop charges. Each student in the Military Department pays $12 for his uniform. For a student coming from another state, $50 should be added for Tuition. Additional laboratory fees are as follows: Agronomy, 1, 2, and 3, $1.00 each; Agronomy, 4, 5, $2.50 deposit each; Plant Pathology, $1.00; Soil Bacteriology, $2.50.

The actual expenses of Freshmen range from a minimum of $175 (including Commuter's ticket from Wilmington) through a mean of $300 to a maximum of $530.

Juniors and Seniors in the Reserve Officers' Training Corps receive thirty cents a day for subsistence.

Payments

The matriculation fee of $5.00 must be paid at the time of registration.

The college bill for the first term is due and payable

at the opening of the college year; the bill for the second term, at the opening of the second term. In order to be admitted to classes and laboratories, students must present to the Instructors in charge the Treasurer's receipt for the payment of the fixed charges of the college.

Bills for board are due and payable as follows: one-half of the first term bill at entrance and one-half before November 1; one-half of the second term bill at the opening of the second term and one-half before March 15.

Room rent for the entire year is payable at the opening of the college year.

Registration

Application for admission to college should be made to the Secretary of the Faculty before Tuesday, September 17, 1918. Candidates for admission to the Freshman class are advised to submit their applications and credentials at the time of the Entrance Examinations in June or during the summer preceding the college year in which they wish to enter.

PRIZES AND SCHOLARSHIPS

The Bishop Coleman Memorial Prize: Twenty-five Dollars.
The Alumni Prizes: Fifteen, Ten, and Five Dollars.
Lieutenant Clarke Churchman Memorial Prize: Twenty-five Dollars.
The Philo Sherman Bennett Prize: Twenty Dollars.
The William D. Clark Prize for Mathematics: Twenty-five Dollars.
Trustee Prize: Fifty Dollars.
The State Grange Prizes: Fifteen Dollars, Ten Dollars, and Five Dollars.
The Francis A. Cooch Botanical Prizes: Fifteen Dollars and Ten Dollars.
Old Home Prize (William H. Purnell Memorial).
Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware: One Hundred Dollars.

The Robert Bayne Wheeler Scholarship: One Hundred and Twenty-five Dollars.
The Tatum Memorial Lecture Fund.
The Edward Reynolds Memorial Prizes in Chemistry: Twenty-five Dollars, Fifteen Dollars, and Ten Dollars.

DEGREES CONFERRED AT THE ANNUAL COMMENCEMENT

JUNE 13, 1917

Doctor of Laws

James Harrison Wilson	Wilmington
George Morgan '75 (M. A.)	Philadelphia, Pa.

Doctor of Science

John Edwin Greiner '80 (C. E.)	Baltimore, Md.

Master of Science

Clarence Edward Keyes	Farmington

Bachelor of Arts (Arts and Science Course)

Robert Houston Pepper	Philadelphia, Pa.
Irving Reynolds	New York, N. Y.

Bachelor of Science (Arts and Science Course)

Raymond Mearns Cameron	North East, Md.
James Carlton Hastings	Laurel
Harold Wolfe Horsey	Dover

Bachelor of Science in Agriculture

Richard Morrison Appleby	New Castle
Franklin Tracy Campbell	Washington, D. C
Harvey Wilson Ewing	Zion, Md.
Carl Rudolph Fisher	Philadelphia, Pa.
Francis Albert Gilman	Philadelphia, Pa.
James McConnell Heinel	Newark
John Abel Hopkins, Jr.	Newark

William Virden Marshall	Lewes
William Homer Savin	Cheswold

Bachelor of Science in Civil Engineering

John Hurst Beauchamp	Wilmington
Michael Joseph Fidance	Wilmington
Joseph Holton Jones	Wilmington
Albert Ruth	Wilmington
Edwin Gaylord Smyth	Wilmington
LeRoy Bayard Steele	Elsmere

Bachelor of Science in Mechanical Engineering

Chester Smith	'Henry Clay

Bachelor of Science in Chemical Engineering

Harold Mercer Veasey	Wilmington

STUDENTS IN ATTENDANCE DURING THE COLLEGIATE YEAR 1917-1918

Abbreviations: A. & S., Arts and Science; A., Agriculture; C. E., Civil Engineering; M. E., Mechanical Engineering; E. E., Electrical Engineering; Ch. E., Chemical Engineering; E., Engineering not specified.

SENIOR CLASS

Alexander, Harry Bratton	A. & S.	Elkton, Md.
Alexander, John William	E. E.	Elkton, Md.
Bowen, Knowles Ritchie	C. E.	Newark
Brown, Gassaway Bond	A. & S.	Newark
Cannon, Samuel	A. & S.	Wilmington
Cannon, William Dail	E. E.	Bridgeville
Carswell, Thomas Smyth	Ch. E.	Wilmington
Catts, Elmer Paul	E. E.	Clayton
Cleaver, Henry Paul	C. E.	Marshallton
Crockett, David Leonard	A.	New York, N. Y.
Davis, Jonathan Farr	A.	Meshoppen, Pa.
Goldey, Robert Perkins	A.	Wilmington
Hann, William Hamilton	A.	Raven Rock, N. J
Herdman, Rowland Delaware	A. & S.	Newark
Hoey, William Bigelow	E. E.	Frederica

Hoffecker, Elwood	A.	Newark
Holland, Clyde Simpson	A.	Smyrna
Horsey, Donald Pancoast	A. & S.	Dover
Lauritsen, Allen Louis	C. E.	Lewes
Lovett, Paul DeWitt	A. & S.	Newark
Marks, Ernest Melson	Ch. E.	Wilmington
Mather, John Avery	M. E.	Oswego, Kan.
McCaghey, Frederick Colin	A. & S.	Baltimore, Md.
Meyers, Charles Fulmer	A.	Middletown
Mitchell, William Terry	M. E.	Newark
Saylor, Frank	A. & S.	Wilmington
Stayton, Leon Busick	A. & S.	Wilmington
Sumwalt, Robert Llewellyn	C. E.	Lewes
Swayne, Paul Gilbert	A.	Wilmington
Swing, David Thompson	M. E.	Ridgley, Md.
Taylor, Nathaniel Watkins	A.	Dover
Todd, DeWitt Clinton Davis	C. E.	Wilmington
Walton, Albert Slack	E. E.	Newark
Wilson, Ernest Staton	C. E.	Wilmington
Wilson, Marvel	A.	Milford

JUNIOR CLASS

Aker, Raymond Buehm	A. & S.	Delaware City
Barnard, Daniel Paddock, 4th	Ch. E.	Wilmington
Boggs, Irving Hook	M. E.	Dover
Cannon, Edward Selman	A. & S.	Wilmington
Cantwell, Garrett Reed	Ch. E.	Elsmere
Craig, John Gilbert	A. & S.	Wilmington
Crothers, John Lawson	A.	North East, Md.
Dickey, Richard Earle	A.	Stanton
Downing, Hugh Wagner	M. E.	Dover
Ewing, Earle Elisha	A. & S.	Wilmington
Gutowitz, Abraham	A. & S.	Lewes
Hearne, George Wilson	A. & S.	Georgetown
Humphrey, James Willard	Ch. E.	Claymont
Lang, George Millard	M. E.	Wilmington
Levey, William Scott	Ch. E.	Christiana
Lindsay, Harvey Rose	A.	Providence, Md.
Longland, George Madara	A.	Mt. Pleasant
Loose, Harry Walter	M. E.	Wilmington
Mackie, John Alfred	A. & S.	Kemblesville, Pa.
Marston, Henry White	A.	Wilmington
Martenis, Fred Boorman	A.	Wilmington
Maxwell, Joseph Pierson	E. E.	Wilmington
McElwee, Irviene Reed	Ch. E.	Wilmington

McKay, Herman	A. & S.	Wilmington
McKinney, William	E. E.	Wilmington
McMillan, James Gordon	A. & S.	Wilmington
Meredith, John Hazel	A.	Goldsboro, Md.
Middleton, Leonard	A. & S.	Wilmington
Mitchell, Henry Burton, Jr.	A. & S.	Millsboro
Moore, Willard Springer	E. E.	Wilmington
O'Rourke, Francis Leonard	A.	Newark
Penuel, Firman Clerance	A.	Georgetown
Plam, Louis	A. & S.	Brooklyn, N. Y.
Plam, Michael Walter	E. E.	Brooklyn, N. Y.
Robinson, Jay	Ch. E.	Wilmington
Stewart, William, Jr.	A. & S.	Wilmington
Sturgis, Russell Davis	A.	Wilmington
Sutfin, Charles Ide	A. & S.	Wilmington
Truss, James Petheram	A. & S.	Wilmington
Tunnell, Charles Rodney	A.	Georgetown
Tyson, Frank Howell	A. & S.	Canton, O.
Warner, Charles Curtis	C. E.	Delaware City
West, Harry Derrickson	A. & S.	Christiana
Wise, William Arthur	A. & S.	Wilmington
Wright, Roland Cooper	C. E.	Seaford

SOPHOMORE CLASS

Anderson, John White, 3d	E. E.	Wilmington
Arbuckle, Paul Taylor, Jr.	Ch. E.	Cherry Hill, Md.
Barnard, William Ellison	A. & S.	Camden
Blair, Alexander, Jr.	A. & S.	Wilmington
Brewer, Wayne Curtis	E. E.	Lewes
Buck, Harvey Rowland	A. & S.	Port Deposit, Md
Bugless, Edgar	E. E.	Wilmington
Carey, Lawrence Sherwood	A. & S.	Georgetown
Carswell, Charlesworth	C. E.	Wilmington
Carter, Francis Bayard	A. & S.	Wilmington
Clancy, James Dawson	A. & S.	Camden, N. J.
Cleaver, Charles Vanleer	A.	Marshallton
Colpitts, Robert Adrian	M. E.	Mt. Pleasant
Cullen, George Steele	A.	Elkview, Pa.
Daly, Leonard Barrett	A.	Philadelphia, Pa.
Dare, Mark Donald	A.	Jamesburg, N. J.
Edwards, Charles Grubb	A. & S.	Wilmington
Ely, George Amos	A.	Winterthur
Fell, Harvey Lewis	A.	Wilmington
Franklin, George Washington, 3rd	Ch. E.	Wilmington
Gordy, Leon Hackett	M. E.	Wilmington

Gough, Joseph Thomas, Jr.	A. & S.	Farmington
Graves, Reed	E.	Marietta, Pa.
Grier, Harold Caulk	A. & S.	Milford
Handy, Joseph Breckinridge, Jr.	A. & S.	Stapleton, N. Y.
Henvis, Edmund Wollaston	A. & S.	Wilmington
Hudson, George Henry, Jr.	C. E.	Wilmington
Kennedy, Eugene Harlan	E. E.	Newark
Kennedy, Ralph Pickering	Ch. E.	Marshallton
Kite, Robert Paul	Ch. E.	Wilmington
Lattomus, Winfield Wilson	C. E.	Townsend
Lindell, William Francis	E. E.	Newark
Marvel, Phillip Henry	E. E.	Houston
McCardell, Frank Paul	A.	Wilmington
McDonnell, Thomas Joseph	E.	Wilmington
McWhorter, John Francis, Jr.	A. & S.	Middletown
Nelson, George Merle	E. E.	Delmar
Olcott, John Woodward	A.	Washington, D. C.
O'Neill, John Francis	Ch. E.	Wilmington
Pool, Frank Robinson, Jr.	A.	McDonough
Ritz, Walter Raymond	A. & S.	Newark
Russo, Julio	E. E.	Wilmington
Shaw, Merville Charles	E.	Wilmington
Silver, Bernard Harry	A. & S.	Wilmington
Smith, Draper	A. & S.	Wilmington
Terrell, Hasson Taylor	Ch. E.	Elkton, Md.
Thomas, Norman	M. E.	Canterbury
Van Dyke, George	A. & S.	Salem, N. J.
Whiteman, Thomas Moore	A.	Delaware City

FRESHMAN CLASS

Aikens, George Holton	A. & S.	Wilmington
Alexander, Howard Berton	A.	Oil City, Pa.
Anderson, William Thomas	A. & S.	Henry Clay
Attix, Charles Thomas	A. & S.	Kenton
Bacon, Lewis Heisler Ball	A. & S.	Bacon
Barnard, John Arnold, Jr.	A.	Wyoming
Boulden, Marion Packard	C. E.	Elkton, Md.
Bradley, Henry George	A. & S.	Wilmington
Broughall, William Templin	A. & S.	Wilmington
Brown, Harvey Newton	A. & S.	Newark
Browne, Hugh Cook	A. & S.	Middletown
Casey, John Andrew	A. & S.	Wilmington
Chandler, Albert Norris	M. E.	Wilmington
Cooch, Francis Allyn, Jr.	A.	Newark
Craig, James Draper	Ch. E.	New Castle

Dare, Charles Rulon	A. & S.	Jamesburg, N. J.
Donoho, William Claggett Dorsey	A. & S.	Seaford
Downes, John Schoch	A. & S.	Dover
Elzey, Welton Franklin	A.	Seaford
Evans, Clarence William	A. & S.	Newark
Fairbanks, Joseph Harrison	A.	Wilmington
Feldman, Arthur Leo	A.	Everett, Mass.
Foulk, Robert North	A. & S.	Wilmington
Foulk, William Henry	A. & S.	Wilmington
Frederick, William Heisler	E.	Marshallton
Gass, Charles Wardon	E. E.	Marshallton
German, George Burton	A. & S.	Delmar
Gonce, Robert Levis	A. & S.	Elkton, Md.
Hanby, Chauncey Bayard	M. E.	Pennsgrove, N. J.
Handy, Roland Cookman	A.	Federalsburg, Md.
Harris, Howard Monroe	A.	Preston, Md.
Hemphill, William Albert	E.	Delaware City
Holland, Thomas Wilmer	Ch. E.	Smyrna
Holton, Walter Dean	A. & S.	Newark
Horty, James Albert	E.	Wilmington
Jefferson, Robert Ross	Ch. E.	Federalsburg, Md.
Johnson, Allen Jaquith	M. E.	Middletown
Jones, Harry Herman	A.	Woodside
Keesey, Russell Kirk	E.	Perryville, Md.
Kesselman, Benjamin	A.	Brooklyn, N. Y.
Killen, William Meredith	A. & S.	Felton
Kleine, Theodore John	A.	Philadelphia, Pa.
Kohlerman, James Harold	E. E.	Wilmington
Lewis, Conrad King Dolbey	M. E.	Newark
Lindsay, Walter Davis	E. E.	Providence, Md.
Lord, Fred Clark	A.	Dover
Lynch, Charles Stewart	A. & S.	Wilmington
Mackey, Edgar Ervin	E.	Newark
McCaughan, Hugh, Jr.	M. E.	Wilmington
McMullen, Richard Hutchinson	E. E.	Wilmington
Monaghan, Paul Kane	Ch. E.	Wilmington
Mulrooney, Thomas William	Ch. E.	Wilmington
O'Brien, John Patrick	E.	Philadelphia, Pa.
Olson, Axil Everett	C. E.	Wilmington
Peach, William Paul, Jr.	Ch. E.	Newark
Phillips, Claude Ellis	A.	Delmar
Pierson, John Crumbaugh	A. & S.	Wilmington
Pool, Jefferson Foard	A. & S.	McDonough
Preston, Ira Lucas	C. E.	Trenton, N. J.
Price, George Cleaver	E. E.	Newark
Price, John Fletcher	Ch. E.	Carney's Point, N. J.

Raughley, George Wilson	C. E.	Dover
Rettew, Harvey Fletcher	M. E.	Wilmington
Rimlinger, Andrew Joseph	A. & S.	Wilmington
Roach, Lee	A. & S.	Georgetown
Robin, Nathaniel Halpern	A. & S.	Wilmington
Rosengarten, Meyer	E. E.	Philadelphia, Pa.
Ruos, George Vandenburg	E.	Bridgeville
Schlesinger, Edward Gustavus	A.	Philadelphia, Pa.
Shane, Herman Edward	A. & S.	Georgetown
Sipple, George Massey	A. & S.	Milford
Smith, Walter Dent	E. E.	Wilmington
Smyth, William John	C. E.	Wilmington
Spaid, Arthur Farquhar	C. E.	Dover
Springer, Carl Christopher	A.	Newport
Steele, Ira Kenneth	A.	Newark
Tonkin, Enoch George	M. E.	Wilmington
Vita, Anthony John	A. & S.	New Haven, Conn.
Vogler, Arthur Roland	Ch. E.	Baltimore, Md.
Waples, George Franklin	M. E.	Milton
Ward, Osborne Carlton	A. & S.	Salem, Mass.
Wilson, Joseph Samuel	A.	Georgetown
Wise, Joseph Coley	E.	Smyrna
Work, John Fulton	A. & S.	Elkton, Md.
Young, Howard Pollock	M. E.	Wilmington

SPECIAL STUDENTS

Hitner, Coleman Ellwood	A.	Philadelphia, Pa.
Yacobyan, Leon	M. E.	Wilmington

SUMMARY

	ARTS AND SCIENCE	AGRICULTURE	ENGINEERING	TOTAL
Seniors	9	10	16	35
Juniors	18	11	16	45
Sophomores	16	10	23	49
Freshmen	30	17	38	85
Special		1	1	2
	73	49	94	216

GENERAL SUMMARY

Delaware College	216
Women's College of Delaware	120
Summer School 1917	281
Grand total	617

7H
8/19

DELAWARE COLLEGE BULLETIN

VOLUME XIV NEW SERIES NUMBER 3

APRIL, 1919

ANNUAL CATALOGUE

1918-1919

PUBLISHED QUARTERLY BY THE COLLEGE

NEWARK, DELAWARE

Entered June 22, 1904, at Newark, Delaware, as second-class matter, under Act of Congress of July 19, 1894

CATALOGUE

OF

DELAWARE COLLEGE

1918-1919

WITH

ANNOUNCEMENTS FOR 1919-1920

PUBLISHED BY THE COLLEGE
NEWARK, DELAWARE

1919

JANUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
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1920

JANUARY

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20	21	22	23	24	25	26
27	28	29	30			

JULY

S	M	T	W	T	F	S
				1	2	[illegible]
4	5	6	7	8	9	1[illegible]
11	12	13	14	15	16	1[illegible]
18	19	20	21	22	23	2[illegible]
25	26	27	28	29	30	3[illegible]

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	[illegible]
8	9	10	11	12	13	1[illegible]
15	16	17	18	19	20	2[illegible]
22	23	24	25	26	27	2[illegible]
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	
5	6	7	8	9	10	1[illegible]
12	13	14	15	16	17	1[illegible]
19	20	21	22	23	24	2[illegible]
26	27	28	29	30		

OCTOBER

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10	11	12	13	14	15	1[illegible]
17	18	19	20	21	22	2[illegible]
24	25	26	27	28	29	[illegible]
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	
7	8	9	10	11	12	1[illegible]
14	15	16	17	18	19	2[illegible]
21	22	23	24	25	26	2[illegible]
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	
5	6	7	8	9	10	[illegible]
12	13	14	15	16	17	1[illegible]
19	20	21	22	23	24	2[illegible]
26	27	28	29	30	31	

CALENDAR

1919		
March 4	Tuesday	Meeting of the Trustees, 10.30 a. m.
April 17	Thursday	Easter recess begins, 4.50 p. m.
April 22	Tuesday	Easter recess ends, 8.30 a.m.
May 30	Friday	Memorial Day: a holiday
June 2-6		Final Examinations
June 7	Saturday	Meeting of the Trustees, 10.30 a. m. Class Day—Alumni Day—Farmers Day
June 8	Sunday	Address—Community Meeting, 11.00 a. m. Baccalaureate Sermon, 8.00 p. m.
June 9	Monday	Commencement Exercises, 10.30 a. m. Alumni Luncheon, 12.30 p. m.
June 11-12		Examinations for Admission

SUMMER VACATION

June 30	Monday	Summer School for Teachers opens.
August 8	Friday	Summer School for Teachers closes.
September 16-17		Examinations for Admission
September 18	Thursday	First term begins, 8.30 a. m.
November 25	Tuesday	Meeting of the Trustees, 10.30 a. m.
November 27	Thursday	Thanksgiving Day: a holiday
December 23	Tuesday	Christmas recess begins, 4.50 a. m.
1920		
January 5	Monday	Christmas recess ends, 8.30 a. m.
January 22-31		Mid-Year Examinations
February 2	Monday	Second term begins, 8.30 a. m.
February 21	Saturday	Meeting of the Trustees, 10.30 a. m.
April 1	Thursday	Easter recess begins, 4.50 p. m.
April 6	Tuesday	Easter recess ends, 8.30 a. m.
June 7-11		Final Examinations
June 12	Saturday	Meeting of the Trustees, 10.30 a. m. Class Day—Alumni Day—Farmers Day
June 13	Sunday	Address—Community Meeting, 11.00 a. m. Baccalaureate Sermon, 8.00 p. m.
June 14	Monday	Commencement Day
June 16, 17		Examinations for Admission

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TRUSTEES OF DELAWARE COLLEGE

Ex Officio

The Governor, JOHN G. TOWNSEND, JR., Selbyville

The President of the State Board of Education, CLIFFORD J. SCOTT, Wilmington

The Master of the State Grange, JACOB H. ROSA, Milford

The President of the College, SAMUEL CHILES MITCHELL

H. G. M. KOLLOCK, M. D., Newark 1882
J. HARVEY WHITEMAN, ESQ., Wilmington 1892
CHARLES B. EVANS, ESQ., Newark 1894
WILLIAM T. LYNAM, ESQ., Wilmington 1897
CHARLES S. CONWELL, Camden 1897
DANIEL W. CORBIT, Odessa 1899
L. HEISLER BALL, M. D., Marshallton 1900
W. WATSON HARRINGTON, ESQ., Dover 1900
SAMUEL H. MESSICK, Bridgeville 1902
JAMES E. DUTTON, Seaford 1904
JOHN BIGGS, ESQ., Wilmington 1905
SAMUEL H. DERBY, Woodside 1905
JOSEPH H. HOSSINGER, Newark 1908
THOMAS DAVIS, ESQ., Wilmington 1908
SAMUEL J. WRIGHT, Newark 1910
EDWARD D. HEARNE, ESQ., Georgetown 1910
HENRY RIDGELY, ESQ., Dover 1911
CHARLES M. CURTIS, ESQ., Wilmington 1911
EVERETT C. JOHNSON, Newark 1911
HENRY B. THOMPSON, Greenville 1912
EBEN B. FRAZER, Newark 1913
H. RODNEY SHARP, Wilmington 1915
W. H. HEALD, ESQ., Wilmington 1915
CHARLES BARKER, Milford 1916
EDWARD A. EVANS, Cheswold 1916
H. F. DUPONT, Winterthur 1918
HARRY CANNON, Bridgeville 1918

OFFICERS OF THE BOARD OF TRUSTEES

Henry B. Thompson, *President*
Samuel H. Messick, *Vice President*
Charles B. Evans, *Secretary*

EXECUTIVE COMMITTEE

Henry B. Thompson, *Chairman*

Dr. S. C. Mitchell
Charles R. Miller
H. Rodney Sharp
Charles M. Curtis
S. H. Derby
Henry Ridgely

FINANCE COMMITTEE

Charles R. Miller, *Chairman*

Charles B. Evans
William H. Heald
W. W. Harrington
Harry Cannon

GROUNDS AND BUILDINGS

H. Rodney Sharp, *Chairman*

Charles R. Miller
Harry Cannon
H. F. duPont
E. C. Johnson

AGRICULTURE

S. H. Derby, *Chairman*

H. F. duPont
D. W. Corbit
S. H. Messick
Jacob H. Rosa
E. A. Evans

INSTRUCTION

Henry Ridgely, *Chairman*

S. H. Messick
E. C. Johnson
Dr. S. C. Mitchell
Charles B. Evans
Clifford J. Scott

WOMEN'S COLLEGE

Charles M. Curtis, *Chairman*

Henry Ridgley
Thomas Davis

FACULTY

SAMUEL CHILES MITCHELL, PH. D. — *President*

GEORGE ABRAM HARTER, PH. D.
Professor of Mathematics and Physics

ELISHA CONOVER, A. M.
Professor of Ancient Languages and Literatures

EDWARD LAURENCE SMITH, A. M. — *Dean of the College*
Professor of Modern Languages and Literatures

MERRILL VAN GIESEN SMITH, M. E.
Professor of Mechanical Engineering

CLINTON OSBORNE HOUGHTON, A. B. — *Professor of Biology*

WILBUR OWEN SYPHERD, PH. D. — *Professor of English*

HARRY HAYWARD, S. M.[1] — *Dean of Agriculture*
Professor of Animal Husbandry

CLARENCE ALBERT SHORT, S. M.[2]
Professor of Mathematics and Engineering

CHARLES ANDREW MCCUE, S. B.[3] — *Professor of Horticulture*

ARTHUR ELLIOTT GRANTHAM, A. B., S. B.[4] — *Professor of Agronomy*

CHARLES LYNDALL PENNY. A. M., Sc. D. — *Professor of Chemistry*

EARNEST VANCOURT VAUGHN, PH. D.
Professor of History and Political Science

FIRMAN THOMPSON, S. B. — *Professor of Chemistry*

THOMAS FRANKLIN MANNS, PH. D.
Professor of Plant Pathology and Soil Bacteriology

GEORGE ALBERT KOERBER, E. E. — *Professor of Electrical Engineering*

ALLAN REGINALD CULLIMORE, S. B.[5] — *Dean of Engineering*
Professor of Civil Engineering

CHARLES CONGER PALMER, S. M., D. V. M.
Professor of Bacteriology and Hygiene

HOWARD THOMAS RUHL, A. M. — *Professor of Agricultural Education*

---

1 Absent on Leave for Agricultural Reconstruction Work in France.
2 Major, U. S. A. Camp Adjutant, Camp Travis, Texas.
3 Acting Dean of School of Agriculture.
4 Acting Director of Experiment Station.
5 Major, U. S. A. Engaged in Work of Rehabilitation of Wounded Soldiers.

George Elliott Dutton, A. M. — *Professor of English*

Frank Alfred Hays, Ph. D.[6] — *Professor of Animal Husbandry*

Alexander Graham McGougan, Ph. D. — *Professor of Physics*

James Thurston Ryan — *Professor of Industrial Education*

William Albert Wilkinson, A. M. — *Professor of Psychology and Education*

Claire E. Griffin, Ph. D.[7] — *Professor of Economics and Business Adminstration*

Ward Elverson Duvall, Major, C. A. — *Professor of Military Science and Tactics*

Harold Neff Cummings, A. B., S. B. — *Associate Professor of Civil Engineering and Mathematics*

Charles Wilbur Banks, C. E. — *Associate Professor of Mechanical and Electrical Engineering*

John Marvin LeCato, A. M. — *Associate Professor of Plant Pathology*

William James McAvoy, C. E.[8] — *Assistant Professor of Mathematics*
Physical Director

Kent Roberts Greenfield, Ph. D. — *Assistant Professor of History and Economics*

Charles Henry Rawlins, Jr., Ph. D.[9] — *Assistant Professor of Mathematics*

Claude Carl Spiker, A. M.[10] — *Assistant Professor of Modern Languages*

John Robert Moore, Ph. D. — *Assistant Professor of English*

Reinhold Eugen Saleski, A. M. — *Assistant Professor of Modern Languages*

Finley Melville Kendall Foster, Ph. D. — *Assistant Professor of English*

Eugene Maubert — *Assistant Professor of Modern Languages*

Edgar A. Hodson, S. M. — *Assistant Professor of Agronomy*

John Linton Coyle — *Instructor of Shop Work*

Howard Burton Shipley — *Physical Director*

Thomas Merton George, S. B., — *Instructor in Animal Husbandry*

---

6 Acting Superintendent Experiment Farm.

7 First Lieut., U. S. A. A Transportation Expert of the General Staff.

8 First Lieut., U. S. A. In France.

9 Resigned in February, 1919.

10 Y. M. C. A. Secretary. In France.

STANDING COMMITTEES OF THE FACULTY

ADMISSION: Professor Dutton, *Chairman;* Dean Hayward, Professor Sypherd

ADVANCED DEGREES: Professor Vaughn, *Chairman;* Professor Sypherd, Professor Thompson, Associate Professor LeCato, Associate Professor Cummings.

ADVANCED STANDING: Dean Smith, *Chairman;* Dean Hayward, Dean Cullimore.

ATHLETICS: Faculty Representatives on the Athletic Council—Dean Smith, *President;* Professor Dutton, *Vice President;* Physical Director Shipley, *Manager.*

EXTENSION: Professor Vaughn, *Chairman;* M. O. Pence, T. T. Martin.

PRIZES: Professor Sypherd, *Chairman;* Professor Conover, Professor Koerber.

PUBLICITY: Professor Conover, *Chairman;* Professor Dutton, Assistant Professor Foster.

SCHEDULE: Professor Thompson, *Chairman*; Assistant Professor Foster.

SCHOLARSHIP: Dean Hayward, *Chairman;* Professor Vaughn, Professor Sypherd, Professor Smith, Dean Smith, Professor Dutton, Professor Koerber, Professor Cullimore.

STUDENT ENTERTAINMENTS, ORGANIZATIONS, AND PUBLICATIONS: Professor Sypherd, *Chairman;* Professor McCue, Professor Koerber, Assistant Professor Foster.

STUDENTS' SCHEDULES: Arts and Science—Professor Sypherd, *Chairman;* Professor Conover, Professor Vaughn. Agriculture—Dean Hayward, *Chairman;* Professor Grantham, Professor McCue. Engineering—Dean Cullimore, *Chairman;* Professor Smith, Professor Koerber.

STUDENT SELF-HELP: Professor Dutton, *Chairman;* Professor Koerber, Professor McCue.

OTHER OFFICERS

Secretary of the Faculty, Dean E. L. Smith
Secretary to the President, Helen Steele
Secretary to the Dean of the College, Cornelia G. Pilling

Acting Librarian, Professor W. O. Sypherd
Assistant Librarian, May Kerr

Business Administrator, A. G. Wilkinson
Superintendent of Grounds and Buildings, D. Lee Rose
Director of the Commons, Carrie Stuart

EXPERIMENT STATION STAFF

HARRY HAYWARD, S. M.[11]	*Director*
A. E. GRANTHAM, A. B., S. B.	*Acting Director, Agronomist*
C. A. MCCUE, S. B.	*Horticulturist*
THOMAS F. MANNS, PH. D.	*Plant Pathologist*
A. C. WHITTIER, S. B.	*Chemist*
E. M. R. LAMKEY, PH. D.	*Plant Physiologist*
F. A. HAYS, PH. D.	*Animal Husbandman*
	Acting Superintendent of College Farm
H. T. KING, S. B.	*Assistant Chemist*
C. C. PALMER, S. M., D. V. M.	*Bacteriologist and Animal Hygienist*
C. C. WIGGANS, PH. D.	*Research Horticulturist*
J. M. LECATO, M. A.	*Associate Plant Pathologist*
LEON DANA, A. C.*	*Assistant Agronomist*
MERTON G. THOMAS, S. B.	*Assistant Animal Husbandman*
HELEN UPDEGRAFF, S. M.*	*Assistant Chemist*
R. A. NEHF, S. B.	*Assistant Horticulturist*
MARION C. BUTTERWORTH, A. B.*	*Secretary*
MARION C. BROWN	*Librarian*

EXTENSION DEPARTMENT

H. HAYWARD, S. M.	*Director*
M. O. PENCE, S. B.	*State Leader of County Agents*
	Acting Director of Extension
THEODORE T. MARTIN, A. B., S. B.	*Boys' and Girls' Club Leader*
GERTRUDE L. BLODGETT, S. B.	
	State Leader of Home Demonstration Agents
AGNES P. MEDILL	
	Assistant State Leader of Boys' and Girls' Club Work
JOHN F. DAVIS, S. B.*	*Farm Help Specialist*
RUSSELL M. BROWN*	*Dairy Agent*
MORRIS ZURKOW, V. M. D.	*Specialist in Hog Cholera*

Assigned by the Bureau of Animal Industry, U. S. Dept. of Agri.

COUNTY AGENTS

R. O. BAUSMAN, S. B., *New Castle County*
A. D. COBB, S. B., *Kent County*
M. C. VAUGHAN, S. B., *Sussex County*

HOME DEMONSTRATION AGENTS

LAURA J. BRYANT, *City of Wilmington*
HELEN L. COMSTOCK, S. B., *New Castle County*
C. EVA MILLER, S. M., *Sussex County*
CLARA M. NIXON, S. M., *Poultry Specialist*
ANNA W. PIERSON, *City of Wilmington*[12]
HAZEL PLUMMER, S. B., *Kent County*[12]*

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* Resigned.
11 Absent on leave for Agriculture Reconstruction work in France.
12 Headquarters not in Newark.

DELAWARE COLLEGE

DELAWARE COLLEGE is situated at Newark, a town of 2000 inhabitants, about half-way between Philadelphia and Baltimore on the main lines of the Pennsylvania and Baltimore and Ohio Railroads running from New York to Washington. The climate is equable; the surrounding country is attractive; and the town itself has all modern improvements, including an excellent supply of artesian well water and a complete sewerage system.

FOUNDATION

Delaware College was chartered as a private college in 1833 by an Act of the Delaware Legislature and was first opened to students in May, 1834. As a result of a succession of misfortunes the college was closed from 1859 to 1870. It was reopened in 1870, having meanwhile been designated by an Act of the Delaware Legislature as beneficiary under the Act of Congress known as the "Morrill Bill," which apportioned to each of the several states large areas of public lands to form the basis of endowments for colleges devoted especially to the teaching of Agriculture, the Mechanic Arts, and Military Tactics. The college was thus under combined private and State ownership until 1913, when it came into the sole possession of the State. It is now in the full sense of the word a State College. The Board of Trustees consists of 28 members, together with the Governor of the State, the President of the College, the Master of the State Grange, and the President of the State Board of Education, all of whom are members ex officio.

BUILDINGS AND GROUNDS

Extensive additions have recently been made to the grounds and buildings of the college. In May, 1915, a large

tract of land lying between Delaware College and the Women's College of Delaware was given to the college by an unnamed donor. On this land buildings are being erected as needed. Wolf Hall, which houses the Departments of Agriculture, Chemistry, Bacteriology, and Biology; Old College, which is used as a Commons and for various other purposes; and Harter Hall, the First Dormitory, which accommodates 59 students, were all completed in 1917.

Frazer Field, the gift of several members of the Frazer family of Newark, affords excellent facilities for outdoor sports and games.

Connected with the college, and used for purposes of instruction and experimentation, is the State Farm, a farm of 217 acres.

The buildings of The Women's College of Delaware, affiliated with Delaware College, are located on a plot of nineteen acres, adjoining the campus of the college.

FINANCIAL SUPPORT

The college is supported by the State of Delaware, by Federal appropriations, and by contributions from Alumni and other friends of the college.

SCOPE OF WORK

The following Courses of Instruction are offered by Delaware College:

I **Arts and Science,** a four years' course, leading to the degree of Bachelor of Arts or Bachelor of Science. See pages 30 to 33.

II **Agriculture,** a four years' course, leading to the degree of Bachelor of Science. See pages 33 to 35,

III **Engineering**—Civil, Mechanical, Electrical, and Chemical — and Marine Transportation, four years' courses, leading to the degree of Bachelor of Science. See pages 35 to 43.

Tuition is free to all students from the State of Delaware. The college constitutes a part of our system of free public instruction. In its scheme of education, the culture of liberal learning and the practical usefulness of the applied sciences are equally emphasized.

Extenson Work

Agriculture. The Agricultural Extension work of Delaware College is supported by a Federal appropriation known as the Smith-Lever fund, supplemented by State appropriations. The work is carried on largely by County Agents, one of whom is located in each county, by a woman trained in home administration, who spends practically the whole of her time in the field, and by dairy and poultry field agents. The function of these agents is to supply the people with the most helpful information, and render any service possible in the development of the agricultural resources of the State.

The college co-operates with the field workers by supplying material and providing lectures, as well as by planning and assisting in inaugurating new projects.

Evening Teacher-Training Course. A course for the preparation of teachers of industrial subjects given in accordance with the requirements of the Smith-Hughes Act.

The work in this course is conducted during the evening or at other times when those enrolled are not employed. Admission to the course will be granted machinists, auto mechanics, sheetmetal workers, plumbers, pattern makers or carpenters between the ages of 25 and 40 years who have had not less than four years' journeyman experience and a good elementary education. The work will be given during one year and will require 136 hours for its completion.

Certification will indicate eligibility to teach in any Smith-Hughes part-time, evening, or trade school in Delaware or in the schools of any State accepting people other

than College or Normal graduates as teachers of industrial subjects.

Requirements for Certification

Mechanical Drawing	20	hours
Trade Mathematics	18	"
Industrial Hygiene	3	"
Industrial Chemistry	5	"
History of Industry	9	"
English	12	"
Mechanics of Teaching	30	"
Corrective Shop Work	9	"
Supervised Practice and Observation Teaching	30	"

General Lectures. The members of the Faculty of Delaware College and of the Women's College of Delaware will, as far as their time permits, deliver lectures before the schools, women's clubs, and other organizations throughout the State.

Summer School

Each year there is held at the College a Summer School of six weeks' duration. This school is under the direction of the head of the Department of Education in the College and is essentially a teachers' training school. The work offered is primarily for the benefit of teachers of rural and elementary schools and includes courses in the common school branches, methods of teaching, school management, etc. Several advanced courses are given for those who expect to teach in the high schools of the State.

A unique feature of the Summer School in Delaware is the fact that the room, board, and transportation expenses of students are paid by the State on condition that they have taught at least one year in the public schools of the State and declare their intention to continue in that capacity for the ensuing year.

Heretofore the summer sessions have been most grati-

fying in every respect. In 1918, despite the abnormal conditions created by the war, 193 students were in attendance and engaged enthusiastically in the work of the session. With the increased interest in education aroused by the recent school survey and the adoption by the legislature of a new school code it is confidently expected that the Summer School will assume even larger proportions and a greater significance to the state.

The session for 1919 will be held from June 30 to August 8, inclusive. For this session an especially strong instructional staff has been selected and plans have been made for meeting as fully as possible the needs of all classes of teachers.

The Experiment Station

The Delaware College Experiment Station, a research department of the college, was made possible by an Act of Congress passed in 1887, known as the Hatch Act. Under the Provisions of this Act each state received an annual appropriation of $15,000 for the establishment of an Agricultural Experiment Station. This was supplemented in 1906 by a similar act known as the Adams Act, which carried an annual appropriation of $15,000 for the use of the Agricultural Experiment Stations that had been established under the law of 1887.

The Experiment Station has a library, research laboratories, and a separate organization staff. It is investigating problems in the fields of Agronomy, Horticulture, Chemistry, Plant Pathology, Soil Bacteriology, and Animal Husbandry. The results of its investigations are published in the form of bulletins, which are distributed free of charge to those interested.

The Women's College of Delaware

Affiliated with Delaware College is the Women's College of Delaware, established by the State in September, 1914. The college offers three courses of instruction leading to degrees:

I **Arts and Science**, a four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Education,** a four years' course leading to the degree of Bachelor of Science.

III **Home Economics,** a four years' course leading to the degree of Bachelor of Science.

In addition to these regular courses, instruction in Agriculture will be offered if a sufficient number of students apply. Tuition is free to students from the State of Delaware. Information in regard to the college may be obtained from the Dean of the Women's College.

REQUIREMENTS FOR ADMISSION

Students are admitted either upon examination at the college or upon certificates from accredited schools or from other colleges or universities. Examinations are held in June and September according to the schedule on pages 28 and 29. Certificates from schools should be presented as early as possible during the summer preceding the session of the college which students wish to attend. Blank certificates may be had upon application.

GENERAL REGULATIONS

Candidates for admission to the Freshman class must be at least 16 years of age and of good moral character.

They must have spent four years in a recognized high school and must present fourteen units as entrance credits.

Candidates wishing to receive entrance credits on subjects not offered in the schools from which they present certificates are required to take examinations in such subjects on days prescribed in the Calendar of the college.

Students should enter at the **beginning of the first**

term, because the subjects which are begun at that time are not repeated in the second term.

Students will not be permitted to enter the college in the first term after October 15, unless they have completed an amount of work equivalent to the work already done by the classes which they wish to enter.

SPECIFIC REQUIREMENTS

Fourteen units are required for admission to all courses leading to degrees. No student will be admitted with more than two conditions.

The term **unit** means the equivalent of five recitations a week for one year in one subject.

The following units are required of all:

English	3	units
Mathematics (Plane Geometry and Algebra)	2½	"
Modern Language	2	"
History	1	unit
Science	1	"
Total	9½	"

Additional units to the number of 4½ must be offered from the following list.

Mathematics	
Solid Geometry	½ unit
Foreign Languages	
Greek	1, 2, 3, or 4 units
Latin	1, 2, 3, or 4 units
German	1, 2, 3, or 4 units
French	1, 2, 3, or 4 units
History	
Ancient	1 unit
Mediaeval and Modern	1 unit
English	1 unit
United States	½ or 1 unit
Civics	½ unit

Science	
Botany	½ or 1 unit
Chemistry	1 unit
Physics	1 unit
Physical Geography	½ or 1 unit
Physiology	½ unit
Zoology	½ or 1 unit
Vocational Subjects	See Note 2.

Arts and Science

In addition to the 9½ units required of all, candidates may offer any of the subjects in the foregoing list in order to make fourteen units. Candidates for the degree of A. B. must offer four units of Latin or Greek, or take a condition in this subject not exceeding 2 units.

Agriculture

In addition to the 9½ units required of all, candidates must select 4½ units from the foregoing list of elective subjects.

Engineering

In addition to the 9½ units required of all, candidates must offer 4½ additional units, including Solid Geometry (½ unit). The required science for candidates for admission to courses in Engineering is Physics. No student will be admitted to a course in Engineering who has not satisfied completely the entrance requirements in Mathematics.

Note 1. All candidates for admission are examined in English Composition in order to test their ability to do the required English of the Freshman year. Examinations are held in June and September. Candidates are advised to take the examination in June. Those who fail will have the opportunity of working privately on the subject during the summer or of taking a course in English in the six weeks' Summer Session.

Note 2. Units in vocational subjects to the number of three will be accepted from graduates of the four-year Smith-Hughes High School Course. Graduates of this course may also substitute two other units for the regular entrance requirement in Modern Language.

Note 3. Beginning with 1920, conditions in Entrance Modern Language must be made up by means of additional work in College.

Detailed Explanation of the Requirements for Admission

English

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

English Grammar and Composition

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description, and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted efforts of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

Literature

The second object is sought by means of two lists of books, headed respectively *Reading* and *Study*, from which may be framed a progressive course in literature covering four years. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages

both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

(a) *Reading.* The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units[1] are to be selected. two from each group:

Group I The Old Testament, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther[2]; the Odyssey, with the omission, if desired, of books I, II, III, IV, V, XV, XVI, XVII; the Iliad, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Vergil's Aeneid. The Odyssey, Iliad, and Aeneid should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II Shakspere: Merchant of Venice; The Tempest; As You Like It; Twelfth Night; Midsummer Night's Dream; Romeo and Juliet; King John; Richard II; Richard III; Henry V; Coriolanus; Julius Caesar; Macbeth; Hamlet.

Group III. Prose Fiction. Malory's Morte d'Arthur (about 100 pages); Bunyan's Pilgrim's Progress, Part I; Swift's Gulliver's Travels (voyages to Lilliput and Brobdingnag); DeFoe's Robinson Crusoe, Part I; Goldsmith's Vicar of Wakefield; Frances Burney's Evelina; Scott's Novels (any one); Jane Austen's Novels (any one); Maria Edgeworth's Castle Rackrent, or The Absentee; Dickens' Novels (any one); Thackeray's Novels (any one); George Eliot's Novels (any one); Mrs. Gaskell's Cranford; Kingsley's Westward Ho! or Hereward the Wake; Reade's The Cloister and the Hearth; Blackmore's Lorna Doone; Hughes' Tom Brown's Schooldays; Stevenson's Treasure Island, or Kidnapped, or Master of Ballantrae; Cooper's Novels (any one); Poe's Selected Tales; Hawthorne's The House of the Seven Gables, or Twice Told Tales, or Mosses from an Old Manse; a collection of Short Stories by various standard writers.

Group IV Essays, Biography, etc. Addison and Steele's The Sir Roger de Coverley Papers, or Selections from the Tatler and Spectator (about 200 pages); Selections from Boswell's Life of Johnson

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1) Each unit is set off by semicolons.

(2) See Delaware College Bulletin, N. S., vol. 12, no. 1, 1916.

(about 200 pages); Franklin's Autobiography; Irving's Sketch Book (about 200 pages), or Life of Goldsmith; Southey's Life of Nelson; Lamb's Essays of Elia (about 100 pages); Lockhart's Life of Scott (about 200 pages); Thackeray's Lectures on Swift, Addison, and Steele in the English Humorists; Macaulay's Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederic the Great, Madame d'Arblay (any one); Trevelyan's Life of Macaulay (about 200 pages); Ruskin's Sesame and Lilies, or Selections (about 150 pages); Dana's Two Years Before the Mast; Selections from Lincoln including at least the two inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and the Letter to Horace Greeley, together with a brief memoir or estimate; Parkman's The Oregon Trail; Thoreau's Walden; Lowell's Selected Essays (about 150 pages); Holmes' The Autocrat of the Breakfast Table; Stevenson's An Inland Voyage, and Travels with a Donkey; Huxley's Autobiography, and selections from Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; a collection of Essays by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of Letters by various standard writers.

Group V Poetry. Palgrave's Treasury (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's Golden Treasury (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley, if not chosen for study under (*b*); Goldsmith's The Traveller, and The Deserted Village; Pope's The Rape of the Lock; A collection of English and Scottish ballads, as, for example, some Robin Hood ballads, The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens, and a selection from later ballads; Coleridge's The Ancient Mariner, Christabel, and Kubla Khan; Byron's Childe Harold, Canto III or IV, and The Prisoner of Chillon; Scott's The Lady of the Lake, or Marmion; Macaulay's The Laws of Ancient Rome, The Battle of Naseby, The Armada, Ivry; Tennyson's The Princess ,or Gareth and Lynette, Lancelot and Elaine, and The Passing of Arthur; Browning's Cavalier Tunes, The Lost Leader, How They Brought the Good News From Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus—, Instans Tyrannus; Arnold's Sohrab and Rustum, and The Forsaken Merman; Selections from American poetry, with special attention to Poe, Lowell, Longfellow, and Whittier.

(b) *Study* This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

Group I Drama. Shakspere's Julius Caesar, Macbeth, Hamlet.

Group II Poetry. Milton's L'Allegro, Il Penseroso, and either Comus or Lycidas; Tennyson's The Coming of Arthur, The Holy Grail, and The Passing of Arthur; the selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's Golden Treasury (First Series).

Group III Oratory. Burke's Speech on Conciliation with America; Macaulay's Two Speeches on Copyright, and Lincoln's Speech at Cooper Union; Washington's Farewell Address, and Webster's First Bunker Hill Oration.

Group IV Essays. Carlyle's Essay on Burns, with a selection from Burns's poems; Macaulay's Life of Johnson; Emerson's Essay on Manners.

Examination

However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling, or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies, and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include:

A General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under (a) *Reading* above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

B A test on the books prescribed for (b) *Study*, which will consist of questions upon their content, form, and structure, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their works, and the periods of literary history to which they belong.

History and Civics

(a) History. Ancient, Mediaeval and Modern, English, United States. The requirement is a regular year's work in one of these subjects.

(b) Civics. Whether given separately or in connection with United States History, this work must be the equivalent of a regular course pursued for a half year. Considerable attention should be given to the actual workings of government.

Mathematics

(a) Algebra. The four fundamental operations. with emphasis placed upon type forms in multiplication and division, factoring, highest common factor, least common multiple, fractions, fractional equations, simultaneous equations of first degree. evolution, theory of exponents, radicals, quadratic equations of one unknown quantity, and solution of problems. Emphasis should be placed on factoring and solution of literal equations.

(b) Plane Geometry. The usual theorems and constructions of good text books. An important part of the work consists in the solution of original exercises, including loci, and numerical problems. Accuracy and acuteness in thinking are desired more than mere geometrical knowledge.

(c) Solid Geometry. The usual theorems and constructions of good text books; relations of lines and planes; properties of prisms, pyramids, cylinders, cones; the sphere and spherical triangle. Emphasis should be placed on problems of mensuration, loci, and the relation of parts in spherical triangles and polygons.

(d) Advanced Algebra. Convergency and Summation of Series, Binomial Theorem, Permutations and Combinations. Undertermined Coefficients, Logarithms, Theory of Equations, and Determinants.

(e) Plane Trigonometry. Trigonometric ratios and their relations; derivation of general ratios; proofs of general formulas, especially trigonometric functions of sum of two angles, difference of two angles, and multiple angles; proving of identities; use of logarithms and solution of right and oblique triangles.

Physics

Candidates for admission who may bring certificates from an accredited high school stating that they have completed one year's work of five recitations a week covering the elementary principles of Physics and including laboratory exercises of at least two hours a week will be accepted as satisfying the entrance requirements in Physics.

As a requirement for admission of other applicants, in addition to passing an examination in the subject as covered in an ordinary high school text book on Physics, they must submit satisfactory notes on the laboratory work they may have done.

Latin

1 The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less in amount than Caesar, Gallic War, I--IV; Cicero, the orations against Catiline, for Manilian Law, and for Archias; Vergil, Aeneid, I-VI.

2 The amount of reading specified above shall be selected by the schools from the following authors and works: Caesar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters, and De Senectute) and Sallust (Catiline and Jugurthine War); Vergil (Bucolics, Georgics, and Aeneid) and Ovid (Metamorphoses, Fasti, and Tristia.).

3 Grammar and Composition. The examination in grammar and composition will demand a thorough knowledge of all irregular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The Roman method of pronunciation is used.

Greek

Xenophon, Anabasis, Books I-IV. Homer, Iliad, Books I-III. A thorough knowledge of Greek Grammar.

Modern Languages

(a) German, Elementary. 1, Careful drill in pronunciation; 2, the memorizing and frequent repetition of easy colloquial sentences; 3, drill upon the rudiments of grammar, that is, upon the inflection of the articles, of such nouns as belong to the language of every-day life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word order; 4, abundant easy exercises designed not only to fix in mind the forms and the principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; 5, the reading of from 100 to 125 pages of graduated texts.

(b) German, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in German (b)

will not be given credit for it unless they have passed also the examination in German (a).

Applications should be accompanied by a statement of the text books used and the number of pages translated.

(a) French, Elementary. 1, Careful drill in pronunciation; 2, the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural nouns, the inflection of adjectives, participles, and pronouns; the use of the personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; 3, abundant easy exercises, designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in reproduction of natural forms of expression; 4, the reading of from 100 to 125 pages of graduated texts.

(b) French, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in French (b) will not be given credit for it unless they have passed also the examination in French (a).

Applications should be accompanied by a statement of the text books used and the number of pages translated.

Science

One year's work of 36 weeks, five recitations weekly, of high school grade, covering the elementary principles of any one of the several sciences, will be accepted as an entrance requirement. The student in addition to the examination must submit his notes on laboratory or field work of the year.

ADMISSION TO ADVANCED STANDING

Candidates for entrance to an advanced class in any of the courses are required either to sustain examinations in all studies of the courses up to the point at which they seek admission, or to present from other colleges certificates covering such studies.

ENTRANCE EXAMINATIONS

Entrance examinations will be held at the college in Newark on Wednesday and Thursday, June 11 and 12, 1919,

beginning at 9 a. m.; also on Tuesday and Wednesday, September 16 and 17, 1920, at the same hours.

Ancient History or English History—9.00-10.30, Wednesday, June 11, and Tuesday, September 16.

Algebra—10.30-12.30, Wednesday, June 11, and Tuesday, September 16.

Geometry—1.30-3.00, Wednesday, June 11, and Tuesday, September 16.

Latin—3.15-4.30, Wednesday, June 11, and Tuesday, September 16.

Greek and Physics—9.00-10.30, Thursday, June 12, and Wednesday, September 17.

English—10.30-12.30, Thursday, June 12, and Wednesday, September 17.

History of the United States and Civil Government—1.15-2.45, Thursday, June 12, and Wednesday, September 17.

Solid Geometry—2.45-4.30, Thursday, June 12, and Wednesday, September 17.

Hours for examinations in other subjects will be arranged for with the candidates who offer such subjects.

COURSES OF STUDY

Delaware College offers the following courses of study:

I **Arts and Science**—A four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Agriculture**—A four years' course leading to the degree of Bachelor of Science in Agriculture.

III **Engineering** — Civil, Mechanical, Electrical, Chemical, Marine Transportation — A four years' course leading to the degree of Bachelor of Science in the special field of study.

CHOICE OF STUDY

Students may, with the approval of their parents or guardians, enter any one of the departments; or they may select such studies as they are prepared to pursue, when circumstances make it advisable not to enter a regular course. Except in the case of mature students who may desire to do special work in any department, it is strongly urged that all students for admission prepare themselves for undertaking the work of a regular course. Opportunity is offered students of sufficient maturity and preparation, who do not wish to take any of the regular courses, to pursue special studies determined by some definite end in view.

Each special student is required to have at least fifteen recitations, or their equivalent, weekly, unless especially excused for cause.

Changes from one course to another may be made only at the opening of a term, with the approval of the Faculty and the consent of the parent or guardian.

COURSE IN ARTS AND SCIENCE

This course is designed to meet the requirements of a liberal education and to lay the foundation for professional and business careers. In accordance with this general aim considerable freedom in the choice of studies is allowed, particularly in the last two years of the course. The studies of the Freshman year are virtually prescribed.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 128 credit term-hours of work in addition to Military Science and Physical Training. During the Senior year, every candidate for graduation must submit a satisfactory thesis to the head of the Department in which he has taken his major.

Graduates from the course in Arts and Science who have offered for admission four years of Latin or Greek, or who have completed in college an equivalent amount of

work will receive the degree of Bachelor of Arts; all other graduates will receive the degree of Bachelor of Science.

Prescribed Studies

	Credits
English	16
Mathematics	8
Modern Language	12
Science (Chemistry, Zoology, Botany, or Physics)	12
History and Economics	12
	60
Military Drill	6
Physical Training	2

FRESHMAN YEAR

First Term	H.*	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Mathematics, 1 and 3	4	4	Mathematics, 18 and 4	4	4
Language—Latin, French, or German	3	3	Language—Latin, French, or German	3	3
History, 1	3	3	History, 2	3	3
Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6	Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6
Military Science, 1	3	1.5	Military Science, 2	3	1.5
Physical Training, 1	1	0.5	Physical Training, 2	1	0.5

* The capital letters H. and C. refer to Actual Hours and Credit Hours respectively.

SOPHOMORE, JUNIOR, AND SENIOR YEARS

At the beginning of the Sophomore year, every candidate for the degree of Bachelor of Arts or Bachelor of Science shall select from the following groups a major study, in which he shall complete thereafter 18 hours of work. In addition, he must take from the group from which he selects his major at least one additional course after the Freshman year.

During these three years students must take in addi-

tion to the required work in Military Science and Physica Training all prescribed subjects not completed in th Freshman year and elective courses sufficient to make a total of thirty credit term-hours each year.

Group A

Greek
Latin
French
German
English
History
Business Administration
Education

Group B

Biology
Chemistry
Mathematics and Physics

Elective Courses

	1st Term	*2nd Term*
Ancient Languages, 1, 2, 3, 4, 5, 6, 7, 8	3	3
Ancient Languages, 21, 22, 23, 24, 31, 32	3	3
Bacteriology, 1 and 2	3	3
Bacteriology, 3 and 4	3	3
Biology, 1 and 2	3	3
Biology, 3 and 4	2	2
Biology, 5 and 6	2	2
Biology, 7 and 8	2	2
Business, 1, 2	3	3
Business, 3, 4	3	3
Chemistry, 11 and 12	2	2
Chemistry, 15 and 16	3	3
Chemistry, 21 and 22	3	3
Chemistry, 23 and 24	3	3
Chemistry, 26	–	5
Chemistry, 33 and 34	2	2
English, 19	3	–
English, 28	–	3
English, 34	–	3
History, 9, 10	3	3
History, 11, 12	3	3
History, 13, 14	3	3
History, 15, 16	3	3
History, 21 and 22	3	3
History, 29 and 30	3	3
Horticulture, 33	3	–
Hygiene, 3 and 4	–	4
Mathematics, 5, 6	4	4
Mathematics, 7 and 8	3	3
Mathematics, 9 and 10	3	3
Mathematics, 14 and 15	2	2
Mineralogy, 31, 32	3	3
Modern Languages, 1, 2, 3, 4, 5, 6, 7, 8	3	3
Modern Languages, 21, 22, 23, 24, 41, 42	3	3

Chemistry, 35 and 36..	3	3
Chemistry, 41 and 42..	3	3
Chemistry, 43 and 44..	3	3
Chemistry, 45 and 46..	3	3
Chemistry, 47 and 48..	3	3
Chemistry, 50	–	1
Chemistry, 51	1	–
Chemistry, 52	–	1
Civil Engineering, 34..	1	1
Economics, 1, 2	3	3
Economics, 3	3	3
Education, 1	3	–
Education, 3, 4	3	3
Education, 5, 6	3	3
English, 11	3	–
English, 13 and 14 ...	1	1
English, 15	3	–
English, 16	–	3
Modern Languages, 43, 44, 63, 64, 65, 66, 74, 78	3	3
Physics, 1, 2	3	3
Physics, 3, 4	1.5	1.5
Physics, 10	–	3.5
Physiology, 1, 2	3	3
Psychology, 1, 2	3	3
Psychology, 3	3	–
Sociology, 1, 2	3	3
Sociology, 4	–	3

COURSE IN AGRICULTURE

The course in Agriculture combines a technical course in Agriculture with as much cultural training as possible. Agriculture is viewed as applied science and the course is planned to give the student a broad foundation in the fundamental sciences which underlie modern agricultural practice.

The aim of the course is to train and develop men to become farm managers, teachers, or specialists in some of the various phases of Agriculture.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 138 credit term hours of work in addition to military science and physical training. All Agricultural students will be required to spend at least six months, or their equivalent, before the Senior year, in practice work on a farm. All candidates for a degree in Agriculture must pass an examination in farm practice before December 1 of the Senior year.

Candidates for a degree in Agriculture must at the beginning of the Junior year register with the Dean of Agriculture as students majoring in Agronomy, Animal

Husbandry, or Horticulture. A minimum of 25 credit term hours must be taken in the department in which the student is majoring. The student should consult with the head of the department in which he is taking his major work, regarding his selection of elective subjects during his Junior and Senior years.

Except by special permission from the Dean of Agriculture, Sophomores, Juniors, and Seniors will not be allowed to take in any one term more than 20 credit hours, and Freshmen more than 18 credit hours, exclusive of military science and physical training.

Prescribed Studies

	Credits
English, 1, 2, 3, and 4	10
Biology, 1, 2, 7, and 8	12
Chemistry, 11, 12, 15, 21, 22, 23, and 26	21
History, 3, and 21	4
Economics, 3	3
Sociology, 4	3
Bacteriology, 1 and 2	6
Physics, 1 and 3	4.5
Plant Pathology, 2; or Hygiene, 2	3
Farm Management, Agr, 6	3
Genetics, Hort, 33	3
Agronomy, 1, 4, and 5	9
Animal Husbandry, 17, 18, and 19	9
Horticulture, 16, 17, and 18	9
Seminars	2
Elective Agricultural Subjects	14
Free Electives	22.5
Total	138

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Biology, 7	5	3	Biology, 8	5	3
Chemistry, 11	2	2	Chemistry, 12	2	2
Chemistry, 15	6	3	Horticulture, 16	4	3
Agronomy, 1	4	3	Animal Husbandry, 18	4	3
Animal Husbandry, 17	4	3	Elective Agriculture	–	3
Military Science, 1	3	1.5	Military Science, 2	3	1.5
Physical Training, 1	1	0.5	Physical Training, 2	1	0.5

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 3	2	2	English, 4	2	2
History, 3	1	1	Chemistry, 22	5	3
Chemistry, 21	5	3	Chemistry, 26	5	5
Chemistry, 23	6	3	Agronomy, 4	5	5
Physics, 1, 3	6	4.5	Horticulture, 18	4	3
Horticulture, 17	4	3	Elective Agriculture		3
Animal Husbandry, 19	4	3	Military Science, 4	3	1.5
Military Science, 3	3	1.5	Physical Training, 4	1	0.5
Physical Training, 3	1	0.5			

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Economics, 3	3	3	Sociology, 4	3	3
Bacteriology, 1	5	3	Bacteriology, 2	5	3
Agronomy, 5	5	3	Hygiene, 2, or....		
Horticulture, 33	3	3	Plant Pathology, 2	5	3
Biology, 1	5	3	Biology, 2	5	3
Elective		3	Electives		6
Military Science, 5	3	1.5	Military Science, 6	3	1.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
History, 21	3	3	Agronomy, 6	5	3
Seminar	2	1	Seminar	2	1
Electives		14	Electives		14
Military Science, 7	3	1.5	Military Science, 8	3	1.5

SHORT COURSE IN AGRICULTURE

A short course in Agriculture extending over a period of approximately six weeks will be given during the winter of 1919-20.

COURSES IN ENGINEERING

CIVIL ENGINEERING

The Department of Civil Engineering provides a rigorous training in the fundamentals of civil engineering, supplemented by studies of a distinctly broadening character. The aim of the course is to develop men who

can creditably fill positions where a breadth of view and a thorough training are prime requisites.

In the fourth year, one and only one of the four options must be taken. The options provide a solid basis for Municipal, Structural, Railroad, or Highway work.

Freshmen and Sophomores are required to attend the summer school of Surveying, which will be held during the two weeks immediately after the close of college in June.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Modern Language, 1 or 63	3	3	Modern Language, 2 or 64	3	3
Mathematics, 15	4	4	Mathematics, 16	4	4
Civil Engineering, 21	2	1	Civil Engineering, 22	2	1
Chemistry, 11	2	2	Chemistry, 12	2	2
Chemistry, 15	6	3	Mech. Engineering, 22	2	2
Mech. Engineering, 21	2	2	Mech. Engineering, 24	3	1.5
Mech. Engineering, 23	3	1.5	Mech. Engineering, 52	3	1.5
Mech. Engineering, 51	3	1.5	Military Science, 2	3	1.5
Military Science, 1	3	1.5	Physical Training, 2	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 3	2	2	English, 4	2	2
Modern Language, 3 or 65	3	3	Modern Language, 4 or 66	3	3
Mathematics, 5	4	4	Mathematics, 6	4	4
Physics, 5	5	5	Physics, 6	5	5
Physics, 7	3	1.5	Physics, 8	3	1.5
Civil Engineering, 23	4	3	Civil Engineering, 24	4	3
Mech. Engineering, 25	3	1.5	Mech. Engineering, 26	3	1.5
History, 5	3	3	History, 6	3	3
Military Science, 3	3	1.5	Military Science, 4	3	1.5
Physical Training, 3	3	0.5	Physical Training, 4	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 7	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 12	5	5
Mineralogy, 31	3	3	Mineralogy, 32	3	3
Hygiene, 3	1	1	Hygiene, 4	2	1
Civil Engineering, 27..	2	1	Civil Engineering, 28..	2	1
Civil Engineering, 17..	3	3	Civil Engineering, 18..	3	3
Civil Engineering, 25..	5	3.5	Civil Engineering, 26..	7	5.5
Elec. Engineering, 11..	2	2	Mech. Engineering, 2..	3	3
Military Science, 5	3	1.5	Military Science, 6	3	1.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 8	1	1
Civil Engineering, 1 ..			Civil Engineering, 2 ..		
Civil Engineering, 5 ..	4	4	Civil Engineering, 6 ..	4	4
Civil Engineering, 7 ..	4	4	Civil Engineering, 8 ..	4	4
Civil Engineering, 29 .	3	1.5	Business Administration, 5	3	3
Business Administration, 3	3	3	Military Science, 8	3	2.5
Military Science, 7	3	1.5			

Structural

Civil Engineering, 9 ..	5	5	Civil Engineering, 30 .	8	6

Municipal

Civil Engineering, 15 .	5	5	Civil Engineering, 16 .	4	4
			Civil Engineering, 32 .	5	2.5

Highway

Civil Engineering, 13 .	4	4	Civil Engineering, 14 .	4	4
			Civil Engineering, 34 .	5	2.5

Railroad

Civil Engineering, 11 .	4	4	Civil Engineering, 12 .	4	4
			Civil Engineering, 36 .	5	2.5

MECHANICAL AND ELECTRICAL ENGINEERING

This department offers two courses, one in Mechanical Engineering and one in Electrical Engineering, each leading to the degree of Bachelor of Science. The courses are designed to teach the principles of Mechanical and Electrical Engineering and to train young men to meet

successfully the problems which an engineer may encounter. Besides offering instruction in purely technical studies, the courses also provide the elements of a liberal education, including the subjects of English Composition, oral and written, English Literature, History, French or German, Mathematics, Physics, and Chemistry.

Both courses are the same for the first three years. During the fourth year, students who take one course or the other pursue separately the subjects pertaining to their particular course. Many studies, however, remain common to both courses.

The department has a wood-working and machine shop and mechanical and electrical laboratories.

Students are required to furnish all instruments and materials used in the drafting-room. The materials must conform strictly to the requirements of the department, and the instruments must meet with the approval of the instructor.

Every candidate for graduation is required to present a satisfactory thesis which shall embody the results of some investigation which he has personally made. These theses must be typewritten and must be accompanied by such drawings and other sheets as are necessary to illustrate and explain the subject. The theses must be approved by the English Department before they will be accepted.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Modern Language, 1 or 63	3	3	Modern Language, 2 or 64	3	3
Mathematics, 15	4	4	Mathematics, 16	4	4
Chemistry, 11	4	4	Chemistry, 12	4	4
Chemistry, 15	6	3	Civil Engineering, 22	2	1
Civil Engineering, 21	2	1	Mech. Engineering, 22	2	2
Mech. Engineering, 21	2	2	Mech. Engineering, 24	3	1.5
Mech. Engineering, 23	3	1.5	Mech. Engineering, 52	3	1
Mech. Engineering, 51	3	1	Military Science, 2	3	1.5
History, 3	1	1	Physical Training, 2	1	0.5
Military Science, 1	3	1.5			
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 3	2	2	English, 4	2	2
Modern Language, 3 or 65	3	3	Modern Language, 4 or 66	3	3
Mathematics, 5	4	4	Mathematics, 6	4	4
Physics, 5	5	5	Physics, 6	5	5
Physics, 7	3	1.5	Physics, 8	3	1.5
Mech. Engineering, 25	3	1.5	Mech. Engineering, 26	3	1.5
Mech. Engineering, 53	3	1	Mech. Engineering, 28	3	1.5
Mech. Engineering, 59		2	Mech. Engineering, 54	3	1
Military Science, 3	3	1.5	Military Science, 4	3	1.5
Physical Training, 3	1	0.5	Physical Training, 4	1	0.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 7	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 12	5	5
Civil Engineering, 27	2	1	Civil Engineering, 28	2	1
Civil Engineering, 17	3	3	Mech. Engineering, 2	3	3
Mech. Engineering, 29	4	3	Mech. Engineering, 30	4	3
Mech. Engineering, 55	3	1	Mech. Engineering, 56	3	1
Elec. Engineering, 1	2	2	Elec. Engineering, 2	2	2
Elec. Engineering, 41	3	1.5	Elec. Engineering, 42	3	1.5
Military Science, 5	3	1.5	Military Science, 6	3	1.5

SENIOR YEAR—MECHANICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 8	1	1
Civil Engineering, 7	4	4	Civil Engineering, 8	4	4
Mech. Engineering, 3	2	2	Mech. Engineering, 4	2	2
Mech. Engineering, 5	4	4	Mech. Engineering, 6	4	4
Mech. Engineering, 7	2	2	Mech. Engineering, 8	2	2
Mech. Engineering, 31	6	3	Mech. Engineering, 32	6	3
Mech. Engineering, 41	6	3	Mech. Engineering, 42	6	3
Elec. Engineering, 7	3	3	Elec. Engineering, 4	3	3
Elec. Engineering, 3	3	3	Elec. Engineering, 46	3	1.5
Elec. Engineering, 45	3	1.5	Military Science, 8	3	1.5
Military Science, 7	3	1.5			

SENIOR YEAR—ELECTRICAL ENGINEERING

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 8	1	1
Civil Engineering, 7...	4	4	Civil Engineering, 8...	4	4
Mech. Engineering, 5.	4	4	Mech. Engineering, 6.	4	4
Mech. Engineering, 7.	2	2	Mech. Engineering, 44	3	1.5
Mech. Engineering, 43	3	1.5	Elec. Engineering, 4..	3	3
Elec. Engineering, 3..	3	3	Elec. Engineering, 8..	2	2
Elec. Engineering, 5..	2	2	Elec. Engineering, 6..	2	2
Elec. Engineering, 7..	2	2	Elec. Engineering, 32.	6	3
Elec. Engineering, 31.	6	3	Elec. Engineering, 44.	6	3
Elec. Engineering, 43.	6	3	Military Science, 8 ...	3	1.5
Military Science, 7 ...	3	1.5			

CHEMICAL ENGINEERING

The course in Chemical Engineering is designed to give thorough instruction in Chemistry and also in some of the more important engineering branches. In addition to the general instruction in Chemistry it includes special work in chemical analysis, organic preparations, industrial chemistry, with the analysis of some of the more important materials and products, water analysis, and gas analysis. It also includes such branches of mechanical and electrical engineering as are particularly useful in the management of manufacturing establishments. Aside from its special purpose this course offers an excellent scientific education. Every candidate for graduation may be required to prepare in his Senior year a thesis giving the results of his own investigations of some approved subject. This course leads to the degree of Bachelor of Science in Chemical Engineering.

REQUIREMENTS FOR GRADUATION

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Modern Language, 1 or 63	3	3	Modern Language, 2 or 64	3	3
Mathematics, 16	1	1	Mathematics, 17	4	4
Mech. Engineering, 21	2	2	Mech. Engineering, 22	2	2
Mech. Engineering, 23	3	1.5	Mech. Engineering, 24	3	1.5
Mech. Engineering, 51	3	1.5	Mech. Engineering, 52	3	1.5

* NOTE—Chemistry, 31 and 32, will be given to Juniors and Seniors together, in the year 1920-21. Likewise, Mineralogy, 1 and 2, will be given to both classes together in the year 1919-20.

Chemistry, 11	2	2	Chemistry, 12	2	2
Chemistry, 15	6	3	Chemistry, 16	6	3
History, 3	1	1	Military Science, 2	3	1.5
Military Science, 1	3	1.5	Physical Training, 2	1	0.5
Physical Training, 1	1	0.5			

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 3	2	2	English, 4	2	2
Modern Language, 3 or 65	3	3	Modern Language, 4 or 66	3	3
Mathematics, 5	4	4	Mathematics, 6	4	4
Physics, 5	4	4	Physics, 6	3	3
Physics, 7	4	2	Physics, 3	2	1
Chemistry, 21	3	3	Chemistry, 22	3	3
Chemistry, 23	6	3	Chemistry, 24	6	3
Mech. Engineering, 25	3	1.5	Mech. Engineering, 26	3	1.5
Mech. Engineering, 53	3	1.5	Mech. Engineering, 54	3	1.5
Mech. Engineering, 59		2	Military Science, 4	3	1.5
Military Science, 3	3	1.5	Physical Training, 4	1	0.5
Physical Training, 3	1	0.5			

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Mathematics, 7	3	3	Mathematics, 8	3	3
Mathematics, 11	5	5	Mathematics, 12	5	5
*Chemistry, 31	3	3	*Chemistry, 32	3	3
Chemistry, 33	2	2	Chemistry, 34	2	2
Chemistry, 35	6	3	Chemistry, 36	6	3
*Mineralogy, 1	3	3	*Mineralogy, 2	3	3
Elec. Engineering, 1	2	2	Mech. Engineering, 1	3	3
Elec. Engineering, 41	3	1.5	Elec. Engineering, 2	2	2
Military Science, 5	3	1.5	Elec. Engineering, 42	3	1.5
			Military Science, 6	3	1.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 8	1	1
*Chemistry, 31	3	3	*Chemistry, 32	3	3
Chemistry, 41	3	3	Chemistry, 42	3	3
Chemistry, 43	3	3	Chemistry, 44	3	3
Chemistry, 45	3	3	Chemistry, 46	3	3
Chemistry, 47	6	3	Chemistry, 48	6	3
Chemistry, 50	2	1	Chemistry, 50	2	1
Chemistry, 51	2	1	Chemistry, 52	2	1
*Mineralogy, 1	3	3	*Mineralogy, 2	3	3
Military Science, 7	3	1.5	Military Science, 8	3	1.5
Elective			*Elective*		
From non-technical subjects)	3	3	From non-technical subjects)	3	3

MARINE TRANSPORTATION *

FRESHMAN YEAR

First Term	H.	*Second Term*	H.
English Composition	3	English Composition	3
Modern Language	3	Modern Language	3
Algebra and Trigonometry	4	Elem. of Eng. Computation	3
Chemistry (Inorganic)	5	Spherical Trigonometry	1
Descriptive Geometry	4	Chemistry (Inorganic)	2
Mechanical Drawing	3	Des. Geom. and Mechanical Drawing	7
Shopwork	3	Shopwork	3
Drill	3	Drill	3
Physical Training	1	Physical Training	1
American Government	2	American Government	2
	31		31

Summer in Shipbuilding Plant in Machine Shop

SOPHOMORE YEAR

First Term	H.	*Second Term*	H.
English Literature	2	English Literature	2
Modern Language	3	Modern Language	3
Analytics	4	Calculus	4
Physics	8	Physics	8
Engineering Drawing	3	Engineering Drawing	3
Economics	3	Economics	3
Drill	3	Drill	3
Physical Training	1	Physical Training	1
	27		27

Summer in Shipbuilding Plant in the Boatyard

JUNIOR YEAR

First Term	H.	*Second Term*	H.
Calculus	3	Elementary Hull Const.	3
Mechanics of Engineering	3	Mechanics of Engineering	3
Kinematics	2	Kinematics	2
Graphics	2	Graphics	2
Practical Astronomy	2	Practical Navigation	2
Direct Currents	6	Alternating Currents	6
International Law	2	Foreign Exchange, Banking	2
European History	3	Transportation	3
Steam Boilers	2	Steam Boilers	2
Drill	3	Drill	3
	28		28

Summer in Engine Erection in Shipyard

* This course as printed in the Catalogue for the present academic year is subject to the detailed changes which may be made by Dean Cullimore, who is now absent on leave.

SENIOR YEAR

First Term	H.	*Second Term*	H.
English Technical Reports.	1	English Technical Reports.	1
Mechanics of Materials ...	4	Mechanics of Materials ...	4
Testing Laboratory	3	Electrical Laboratory	6
Machine Design	6	Machine Design	6
Markets	3	International Trade	3
Hull Construction	3	Hull Construction	3
Steam Engines	4	Steam Engines	2
Business Administration ..	3	Business Finance	3
Drill	3	Drill	3
	30		30

ADVANCED DEGREES

The degree of Master of Arts or Master of Science will be awarded upon the satisfactory completion of a resident course of study in Arts, Science, Agriculture, or Engineering extending over not less than one year. At the beginning of the year in which he expects the degree he shall select a major subject and one or two minor subjects and he shall take in these subjects the equivalent of at least 12 hours' work.

A graduate of any of the courses in Engineering will, after three years of practical and successful work as an Engineer, be entitled to the professional degree of C. E., M. E., E. E., or Ch. E., according to the course he may have pursued. One college year before coming up for the degree the candidate must signify his intention, and also map out a definite and satisfactory course of work.

An incidental fee of $10 must be paid by the candidate for a higher degree before he will be admitted to the final examinations.

SUBJECTS OF INSTRUCTION

In this detailed statement of the subjects of instruction, the number of credit term hours is printed in italics at the end of each course. Not less than two hours and not more than three hours of laboratory work are counted as equivalent to one credit hour, the exact equivalent depending on the nature of the work and the amount of outside preparation required.

Odd numbers are assigned to first term courses; even numbers, to second term courses.

AGRONOMY

PROFESSOR GRANTHAM AND ASSISTANT PROFESSOR HODSON

Agronomy is the science of the field, the soil, and its crops. The soil is studied with reference to its functions as the home of the plant. The fundamental principles of soil management for crop production are especially emphasized. The study of soils presupposes a fair understanding of the principles of physics, chemistry, and plant physiology. Field crops are studied from the standpoint of the adaptation and improvement of plants. A study is made of the economical and business management of the field and its crops. The study of field crops presupposes a general knowledge of botany. A field of twenty-five acres devoted to experimental and research work in Agronomy is used to supplement class and laboratory work. At least one visit to representative farms of the State will be required of Juniors and Seniors in Agronomy.

Agr 1 Field Crop Production. A general course dealing with the history, adaptation, distribution, and classification of cereal and forage crops. Special attention is given to the principles of cultivation, and to the methods of harvesting and marketing which prevail under Eastern conditions. Two lectures and two laboratory hours.

ASSISTANT PROFESSOR HODSON *Three credit hours*

Agr 2 Cereal Crops. (Prerequisites: Agr 1; B 7 and 8). The cultivation, harvesting, and marketing of grain crops. Attention in detail is given to the various methods of production and to the cost. Varieties and types of grain groups are considered, together with the principles of improvement by selection and breeding. Judging of corn,

wheat, oats, etc., and a study of market grades and classification; preservation and testing of field crop seeds. Two lectures and two laboratory hours.

ASSISTANT PROFESSOR HODSON *Three credit hours*

Agr 3 Forage Crops. (Prerequisites: Agr 1; B 7 and 8). A study of the various types and varieties of grasses and leguminous crops used for hay and pasture. Special attention is given to cultural methods, propagation, and value of the various plants for feed and soil improvement. Two lectures and two laboratory hours.

ASSISTANT PROFESSOR HODSON *Three credit hours*

Agr 4 Soil Physics. (Prerequisites: C 11, 12, 15; Ps 1, 3). A study of the origin, formation, classification, and function of soils, the relation of soil texture to temperature, air and moisture, and to plant growth; the effect of methods of tillage and drainage on the physical properties of soils. One lecture and four laboratory hours.

ASSISTANT PROFESSOR HODSON *Three credit hours*

Agr 5 Soil Fertility. (Prerequisites: C 11, 12, 15, 23, 45 and 46; Agr 4). The relation of plant food to the productive capacity of the soil and a study of the methods by which the fertility may be obtained and increased. The ultimate effect of various rotations and of different systems of farming on the fertility of soils. A study of the composition of manures, fertilizers, and amendments, with a comparison of their agricultural and commercial value for different crops. One lecture and four laboratory hours.

PROFESSOR GRANTHAM *Three credit hours*

Agr 6 Farm Management. This course is designed to summarize the student's agricultural training and experience and apply it to the efficient management of the farm as a whole. The organization of the farm as a business enterprise, its arrangement with reference to size and shape of field; systems of crop and livestock management; the relation of fixed to circulating capital; the relation of labor to income; farm accounts, etc.

PROFESSOR GRANTHAM *Three credit hours*

Agr 7 Farm Equipment. Laying out the fields; the location, arrangement, design, construction, and cost of farm buildings, especially barns, granaries, silos, etc.; the adaptability, efficiency, construction, operation, and durability of field machinery; power machinery including steam and gasoline engines; the different kinds of fences, cost, construction, and durability; construction of roads, walks, and drains. One lecture and four laboratory hours.

ASSISTANT PROFESSOR HODSON *Three credit hours*

Agr 8 Plant Breeding. (Prerequisites: Agr 2, 3, 4, 5; Hort 33). The improvement and breeding of field crops including the grains, grasses, and legumes; selection; results obtained by various investigators. Lectures, assigned reading, demonstrations, and laboratory work. One lecture and two laboratory hours.

PROFESSOR GRANTHAM *Two credit hours*

Agr 9 Advanced Soils. (Prerequisites: C 45, 46; Agr 7 and 5). The determination of the nature and quantity of the elements of fertility; effect upon various crops of different fertilizers added to soils, as determined by pot culture and pot experiments; systematic study of similar work of experiment stations and investigators. Assigned readings, reviews, and laboratory work. One lecture and four laboratory hours.

PROFESSOR GRANTHAM *Two credit hours*

Agr 10 Methods of Field Experimentation. (Prerequisites: Agr 2, 3, 4, 5, 8, 9). A course designed for students intending to take up experiment station work. Methods of plotting land for soil and crop experiments; check systems; interpretation of results. The literature of this and other countries pertaining to experimental work will be carefully studied. Two lectures.

PROFESSOR GRANTHAM *Three credit hours*

Agr 11 Farm Power. (Prerequisite: Agr 7). A practical course including the operation, use, and care of gas and steam engines as a source of farm power, and farm tractors. One lecture and four laboratory hours.

ASSISTANT PROFESSOR HODSON *Two credit hours*

Agr 12 Land Drainage. (Prerequisites: Agr 4 and 5). A course designed to present the principles of tile drainage, including the laying out, construction, and maintenance of drains. Practice in surveying, mapping, leveling, and the laying of the tile to grade will be given. Four laboratory hours.

ASSISTANT PROFESSOR HODSON *Two credit hours*

Agr 13 Thesis and Seminar. Original work on an approved subject of investigation.

PROFESSOR GRANTHAM *Three credit hours*

ANCIENT LANGUAGES AND LITERATURES

PROFESSOR CONOVER

Throughout the course the aim is to enable the student to acquire facility and quickness in reading at sight and familiarity with the ancient order of thought. Word-meaning is fixed by inspecting form, derivation, and comparison with synonyms. The authors are selected with a view to their representative character. The public and private life of the Greeks and Romans and their influence on modern literature and civilization are continually kept before the minds of the students. English derivatives and words kindred to all Indo-European tongues are frequently noted, and the general principles of comparative philology are explained and applied.

In addition to the department library, which contains the Delphini edition of Latin writers, the Attic orators and dramatists, etc., the department of classical philology in the general library is steadily growing. It contains bound volumes of the American Journal of Philology and of the Harvard Studies in Classical Philology. The American Journal of Philology is kept on file in the reading room.

LATIN

AL 1 and 2 Cicero, De Senectute and De Amicitia. Ovid, Metamorphoses, etc. Prose Composition.

Six credit hours

AL 3 and 4 Livy, 21st or 22d book. Horace, Odes, Epodes, Satires, Epistles. Prose Composition.

Six credit hours

AL 5 and 6 Tacitus, Germania and Agricola. Plautus, Captives and Trinummus. Juvenal, Satires.

Six credit hours

AL 7 and 8 Seneca, Tragedies or Moral Essays. Terence, Adelphoe and Andria. Quintilian, Books X and XII. Lectures on Latin Literature and Inscriptions.

Six credit hours

GREEK

AL 21 and 22 White's First Greek Book. Anabasis, I, II.

Six credit hours

AL 23 and 24 Anabasis III, IV. Homer, Iliad, I-III. Herodotus VII, VIII.

Six credit hours

AL 25 and 26 Lysias, Orations. Plato, Apology and Crito. Aristophanes, Plutus or Clouds.

Six credit hours

AL 27 and 28 Demosthenes, Orations. Lucian, Dialogues. Aeschylus, Prometheus Bound.

Six credit hours

AL 29 and 30 Greek Prose Composition.

Four credit hours

AL 31 and 32 Greek Testament.

Four credit hours

ANIMAL HUSBANDRY

PROFESSOR HAYS AND MR. THOMAS

The work in Animal Husbandry is designed to familiarize the student with some of the principles underlying this important industry. The class room and laboratory instruction is supplemented by work with the live stock on the College Farm and by visits to the many flocks, herds, and studs of Delaware and Pennsylvania, as well as by attendance at some of the best live stock shows which are held annually within easy reach of the college.

AH 17 Types and Market Classes of Farm Animals. A study of the development of the types of beef cattle, hogs, and sheep, the characteristics of the breeds within the types, and the relation of market requirements to the live stock industry. Laboratory practice in the judging

and selecting of the various classes and simple problems of management will supplement the class room work. Two lectures and two laboratory hours per week. Freshman year.

MR. THOMAS *Three credit hours*

AH 18 Types and Market Classes of Farm Animals. (Prerequisite: AH 17). A continuation of AH 17 embodying the study of types, breeds, and market classes of horses and dairy cattle. Two lectures and two laboratory hours per week. Freshman year.

MR. THOMAS *Three credit hours*

AH 19 Feeding Farm Animals. (Prerequisites: Chem. 11, 12, 15, 21, 23). The fundamental principles of animal nutrition; the composition and qualities of feeding stuffs; the feeding of all classes of farm animals and a general review of experimental work are included. A very fundamental course for successful farm operations. Three lecture hours a week. Sophomore year.

MR. THOMAS *Three credit hours*

COURSES REQUIRED OF STUDENTS SPECIALIZING IN ANIMAL HUSBANDRY

AH 21 Live Stock Management. (Prerequisites: AH 17, 18, 19). This course embodies the care, handling, and management of animals on the farm for sale and show purposes and for general farm operations. Laboratory work embodies the fitting of animals for show and sale and the consideration of the most important practical live stock problems on the farm. Attention is also given to rope work, including knots, splices, rope halters, etc. Two lectures and two laboratory hours per week. Laboratory fee, two dollars. Junior year.

PROFESSOR HAYS *Three credit hours*

AH 22 Advanced Judging. (Prerequisites: AH 17 and 18). The aim of this course is to train students in the selection of desirable sires and breeding females and for judging at fairs. Men representing the college in judging contests will be chosen from this class. Many excellent stock farms within a radius of fifty miles will be visited.

Some lecture work will be given but the course is made up of four laboratory hours a week. Junior year.

PROFESSOR HAYS *Two credit hours*

AH 24 Animal Breeding. (Prerequisites: AH 17, 18; Phys 1, 3; Hort 33; B 1, 2). A series of lectures presenting the newest practical phases of heredity, variation, correlation, prepotency, and their application to breeding of farm animals for production and other purposes. Junior year.

PROFESSOR HAYS *Three credit hours*

AH 25 Animal Nutrition. (Prerequisites: AH 17, 18, 19; Chem 11, 12, 15, 23). This course embodies the technical side of animal nutrition, a full study of the chemistry of the feeding problem, the newer aspects of adequate rations, a study of problems in feeding experiments and other phases concerning the technical side of animal nutrition. Senior year.

PROFESSOR HAYS *One credit hour*

AH 27 Seminar. A weekly conference with Senior students in Animal Husbandry, reports and discussion of current literature, activities and experimental work bearing on the live stock business. Senior year.

PROFESSOR HAYS *One credit hour*

AH 28 Pedigree Study. (Prerequisites: AH 17, 18, and 21). A series of lectures will be given covering general history of breeding developments, blood lines, methods of breeding types of pedigrees, and all the fundamental questions relating to the determination of animal values based upon their ancestry. Two lectures and two laboratory hours per week. Senior year.

PROFESSOR HAYS *Three credit hours*

AH 30 Seminar. Continuation of AH 9. Senior year.

PROFESSOR HAYES *One credit hour*

ELECTIVE SUBJECTS

AH 23 Dairy Cattle Management. (Prerequisites: AH 17, 18, and 19). This is a very practical course including

the fundamental principles of dairy farm husbandry. Questions of feeding, breeding, management, sale, advanced registry testing, methods of successful practice, etc., are carefully considered. Two lectures are given per week, and one two-hour laboratory period, which is used for practical application of principles to different dairy farms. Junior year.

PROFESSOR HAYS *Three credit hours*

AH 29 Creamery Work. (Prerequisites: AH 23). This course considers the problems connected with the handling of dairy products, milk, cream, butter, cheese, ice cream, etc. Lectures will be given on methods of testing milk, butter, cheese, etc.; also practice in different phases of creamery operations and practice work with creamery equipment. Two lectures and two hours laboratory per week. Senior year.

ASSISTANT PROFESSOR THOMAS *Three credit hours*

AH 32 Thesis. Senior year.

Two credit hours

AH 34 Horse, Swine, Sheep and Dairy Cattle Problems. (Prerequisites: AH 21, 24). This course will be made up of a series of lectures bearing upon present day problems in horse, swine, sheep, and dairy cattle farming. It is intended for students who plan to begin the operation of a stock farm. The course will be modified somewhat to meet the demands of students enrolled. Senior year.

PROFESSOR HAYS *Four credit hours*

BACTERIOLOGY, PHYSIOLOGY, AND HYGIENE

PROFESSOR PALMER

BACTERIOLOGY

Ba 1 and 2 General Bacteriology. A study of the structure, development, distribution, and properties of bacteria and the relation of bacteria to animal and plant life. In the laboratory the student will be instructed in the technique necessary for practical work in bacteriology. Both saprophytic and pathogenic organisms will be studied. It is recommended that students complete the course in

general physiology before taking this course. Required of Juniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

Six credit hours

Ba 3 Advanced Bacteriology. (Prerequisite: Ba 1 and 2.) A lecture and laboratory course including an advanced study of the bacteria related to animal life and effects of such organisms upon the body tissues. The course also includes a study of natural and artificial immunity. Elective for Seniors in Agriculture and Arts and Science.

Three credit hours

PHYSIOLOGY

Phy 1 General Physiology. This course includes a study of the structure and functions of animal cells and tissues, followed by a study of the functions of the various organs and systems of the body. Required of Juniors in Animal Husbandry, and elective for Arts and Science students.

Three credit hours

Phy 2 Advanced Physiology. (Prerequisite: Phy 1). This course considers the more highly specialized functions of the body, including glands of internal secretion, special sense organs, and the nervous system. Elective for students in Agriculture and Arts and Science.

Three credit hours

HYGIENE

Hyg 2 Animal Hygiene and Pathology. A study of the methods of preserving the health of farm animals including the chief sporadic and infectious diseases of livestock, their symptoms, diagnosis, and means of control. It is recommended that students taking this course should have completed the courses in General Physiology and Bacteriology. Required of Juniors in Agriculture.

Three credit hours

Hyg 3 and 4 Hygiene and Sanitation. Instruction in this subject covers the principles of sanitation, the cause,

methods of spread and prevention of epidemics, and the various methods of disinfection. Required of Juniors in Civil Engineering and elective for Arts and Science students.

Two credit hours

BIOLOGY

PROFESSOR HOUGHTON

The aim of biological instruction is to give the student some knowledge of the various living things by which he is surrounded, as well as to develop habits of careful observation and comparison, and close and accurate methods of thinking. Most of the time is spent in actual study in the laboratory, which is supplied with simple and compound microscopes, reference works, microtome, reagents, etc. There is also an excellent collection of illustrative specimens and charts.

B 1 and 2 Elementary Zoology. A study of variations in the structure and life history of the different classes of animals, their habits and relations. The student secures a general knowledge of the principles of classification based upon the evolution of the animal kingdom, and the principles of Zoology. Selected types of the principal groups of animals from Protozoa to Mammalia, of which dissections, drawings, and notes are required, are studied in the laboratory. The course gives a comprehensive view of the science of Zoology to the student taking no further work, and forms a basis for advanced work. One recitation or lecture and four hours of laboratory work a week. Required of Juniors in Agriculture. Elective for Arts and Science students.

Six credit hours

B 3 and 4 Systematic and Economic Zoology. (Prerequisite: B 1 and 2). In this course the student becomes acquainted with a large number of our common vertebrates and learns something of their structure, life histories, habits, and economic importance. Much attention is given to the work of tracing typical specimens, representing as many groups as possible, of Fishes, Batrachians, Reptiles, Birds, and Mammals, by means of keys which are based

largely upon structural characters. Thus the student gains a clear idea of the relations of forms and the characters upon which classifications are based. Dissections are made when necessary to understand and properly use the keys. Four hours' laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Four credit hours

B 5 and 6 Economic Entomology. A course treating of the more important injurious insects of orchard, garden, and field crops, also the insect pests of domestic animals and the household. The work deals with their structure, life histories, and descriptions, and the most approved methods for their control. The most important forms are placed before the class for careful examination and comparison. Special emphasis is laid upon the necessity for the ready determination of species. Two recitations or one recitation and two hours of laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Four credit hours

B 7 and 8 General Botany. As is indicated by its title, this is a general course in botany which aims to give the student a comprehensive idea of the subject as a whole. The topics to which particular attention is given in the first term are as follows: seeds and seedlings; roots, stems, and leaves; the morphology, evolution, and taxonomy of the Thallophyta, Bryophyta, and Pteridophyta. In the second term the principal topics are as follows: the Gymnospermae; winter buds; the flower and fruit of the higher seed plants; the morphology and taxonomy of the Angiospermae; ecology and economic botany. One recitation or lecture and four hours of laboratory work a week. Required of Freshmen in Agriculture. Elective for Arts and Science students.

Six credit hours

CHEMISTRY

Courses are offered in inorganic and organic chemistry, qualitative and quantitative analysis, electrochemistry, physical, industrial

and agricultural chemistry. Instruction is given in lectures with experiments and in the laboratory. Courses are adapted to the needs of both general students and special students of chemistry.

C 11 and 12 Inorganic Chemistry. This is an experimental lecture course treating of the elements and their more important compounds. Students in Agriculture and Engineering taking this course are required to take C 15 also.

PROFESSOR PENNY *Four credit hours*

C 15 Qualitative Analysis. This is a laboratory course in elementary qualitative analysis, of six hours in the first term. Students taking C 11 are required to take this course also.

Three credit hours

C 16 Advanced Qualitative Analysis. (Prerequisites: C 11 and 15). This is a laboratory course supplementary to Course 15; it is intended for students seeking a more thorough knowledge of the subject. Six hours.

Three credit hours

C 21 and 22 Organic Chemistry. (Prerequisite: C 11 and 12). This is an experimental lecture course treating of the more important carbon compounds.

PROFESSOR PENNY *Six credit hours*

C 23 Quantitative Analysis. (Prerequisites: C 11 and 12, and 15). This is a laboratory course of six hours in elementary quantitative analysis.

Three credit hours

C 24 Advanced Quantitative Analysis. (Prerequisites: C 11 and 12, 15, 16 and 23). This is a laboratory course supplementary to Course 23; it is intended for students seeking greater proficiency in the subject. Six hours.

PROFESSOR THOMPSON *Three credit hours*

C 26 Agricultural Chemistry. (Prerequisites: C 11 and 12, 15, 21, and 23). The chemistry of soils, fertilizers, feeding stuffs, dairy products, insecticides. Lectures, recitations, and laboratory work. Required of students in Agriculture.

PROFESSOR THOMPSON *Five credit hours*

C 31 and 32 Industrial Chemistry. (Prerequisites: C 11 and 12, and 21 and 22). This is a lecture course treating of the more important industrial processes. Given in 1920-1921, and in alternate years thereafter.

PROFESSOR THOMPSON *Six credit hours*

C 33 and 34 Chemical Calculations. This is a lecture course, with assigned work for students, on the more important mathematical questions arising in chemistry.

PROFESSOR PENNY *Four credit hours*

C 35 and 36 Organic Preparations. (Prerequisites: C 11 and 12, 15, 16, 21 and 22, 23 and 24). This is a laboratory course; it includes elementary organic analysis and the preparation of some important organic compounds.

PROFESSOR THOMPSON *Six credit hours*

C 41 and 42 Physical Chemistry. This course consists of lectures.

PROFESSOR PENNY *Six credit hours*

C 43 and 44 Electrochemistry. (Prerequisites: E E 9 and 30, and C 11 and 12, and 21 and 22). This is a lecture course treating of theoretical and applied electrochemistry.

PROFESSOR PENNY *Six credit hours*

C 45 and 46 Theoretical Agricultural Chemistry. (Prerequisites: C 11 and 12, and 21 and 22). This is a lecture course treating of the chemistry of plant life, of soils and fertilizers.

PROFESSOR PENNY *Six credit hours*

C 47 and 48 Technical Analysis. (Prerequisites: C 11 and 12, 15, 23 and 24). This is a laboratory course intended for special students of chemistry. It treats of some important methods of analysis used in applied chemistry.

PROFESSOR THOMPSON *Six credit hours*

C 50 Electroanalysis. (Prerequisites: C 11 and 12, 15, and 23). This is a laboratory course in the determination of metals by electrolytic methods.

PROFESSOR PENNY *One credit hour*

C 51 Gas Analysis. (Prerequisites: C 11 and 12, 21 and 22, 15 and 23). This is a laboratory course in the analysis of flue gases and illuminating gas.

PROFESSOR PENNY *One credit hour*

C 52 Water Analysis. (Prerequisites: C 11 and 12, 15 and 23). This is a laboratory course in the analysis of potable water and of water used for industrial purposes.

PROFESSOR PENNY *One credit hour*

C 53 Thesis. Original work on an approved subject, in the Senior year.

CIVIL ENGINEERING

PROFESSOR CULLIMORE, PROFESSOR SHORT, AND ASSOCIATE PROFESSOR CUMMINGS

CE 1 and 2 Thesis. Each Senior student in Civil Engineering must prepare as a thesis, with such drawings as are necessary for its proper elucidation, a written description of some structure, machine, or process which he may have examined or designed.

CE 3 Economics. The principles of economics as applied to elementary problems in business and accounting. Recitations and lectures. Required of Seniors in Civil Engineering.

Three credit hours

CE 4 Contracts. Specifications. Business Law. Contracts; specifications; property; negotiable instruments; agency; partnership; insurance; carriers. Recitations and lectures. Required of Seniors in Civil Engineering.

Two credit hours

CE 5 and 6 Hydromechanics. (Prerequisite: M 11 and 12). Hydrostatics; flow of water through orifices and tubes; flow in pipes, conduits, and natural channels; hydraulic machinery; pneumatics. Recitations and lectures. Required of Seniors in Civil Engineering.

Eight credit hours

CE 7 and 8 Mechanics of Materials. (Prerequisites: M 6, and 11 and 12; Ps 5, 6, 7, and 8; CE 27 and 28). Theory of elasticity; simple stresses; strength of pipes and riveted joints; strength and stiffness of beams and of columns and shafts; resilience of materials. Investigation and design. Properties and structural forms of iron and steel. Recitations, lectures, and laboratory. Required of Seniors in Engineering except those in Chemical Engineering.

Eight credit hours

CE 9 Structures. The design of steel and masonry structures. Lectures and recitations. Optional with Seniors in Civil Engineering.

Five credit hours

CE 10 Railroad Economics. Organization, capitalization, operation, maintenance, etc. A study of economic principles as applied to transportation problems. Elective for Seniors in Civil Engineering.

Two credit hours

CE 11 and 12 Railroads. (Prerequisites: M 16; CE 23, 24, 25 and 26). Reconnaissance, preliminary and location surveys, structures; track-work, maintenance, operation; economic theory of location. Recitations and office-work. Optional with Seniors in Civil Engineering.

Eight credit hours

CE 13 and 14 Highways. (Prerequisite: CE 23 and 24). Location, construction, and maintenance of roads, streets, and pavements, including study of tractive forces and of the properties of road materials. Recitations and lectures. Optional with Seniors in Civil Engineering.

Eight credit hours

CE 15 Sewerage. Different systems for the removal of sewage; design, construction, and maintenance of sewers; individual sewers; sewer appurtenances; disposal and utilization of sewage. Recitations, lectures, and visits of inspection. Optional with Seniors in Civl Engineering.

Five credit hours

CE 16 Water Supply. Requisites of a supply; source; construction and maintenance of systems for collecting, storing, purifying, and distributing water. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering.

Four credit hours

CE 17 Building Construction. (Prerequisites: Ps 5, 6, 7 and 8). Materials and their use in construction of buildings. Required of Juniors in Engineering except those in Chemical Engineering.

Three credit hours

CE 18 Framed Structures. (Prerequisites: M 6, and 11 and 12; CE 27 and 28). Lectures in the construction of the common type of trusses; stresses in the common forms of roof and bridge trusses by algebraic methods; elementary problems in investigation. Required of Juniors in Civil Engineering.

Three credit hours

CE 21 and 22 Surveying. Study of the compass, transit and level, and their uses and adjustments; use of chain in land surveys; computations in land surveys. Recitations and field work. Required of Freshmen in Engineering except those in Chemical Engineering. Two hours.

Two credit hours

CE 23 and 24 Surveying. (Prerequisite: CE 21 and 22). Principles; problems; use of chain, compass, level, and transit; theory of construction and use of instruments; land surveying with transit; survey of public lands of the United States; topographical surveying; city, hydrographic, and mine surveying; functions of the surveyor; principles for guidance in original surveys and resurveys; adjustment of observations by method of least squares; theory of construction and use of barometer; plotting and computations from students' own field-notes, involving use of various office instruments. Recitations, lectures, field-work and office-work. Required of Sophomores in Civil Engineering. Four hours.

Six credit hours

CE 25 and 26 Surveying. (Prerequisite: CE 23 and 24). Circular curves; complete topographical survey of a tract of land and location of an industrial spur track; mapping; mathematical astronomy for field use; determination of latitude, azimuth, time, and longitude; use of sextant and solar transit,—day and night observations. Recitations, lectures, field-work, and office-work. Required of Juniors in Civil Engineering.

First term, three and a half credit hours; second term, five and a half credit hours

CE 27 and 28 Graphic Statics. (Prerequisite: M 16). Coplanar forces, concurrent and non-concurrent; friction; center of gravity; moment of inertia; simple trusses; problems. Recitations, lectures, and drawing. Required of Juniors in Engineering except in Chemical Engineering. Two hours a week.

Two credit hours

CE 29 Engineering Laboratory. Study of construction and use of testing apparatus, including testing machines and attachments; examinations and tests of structural materials; discussion of results; preparation of reports. Required of Seniors in Civil Engineering. Three hours.

One and a half credit hours

CE 30 Structural Design. The detailed design and making of shop drawings for steel structures. Optional with Seniors in Civil Engineering.

Four credit hours

CE 32 Hydraulic Design. A course in the drafting-room to accompany CE 16. The design of water-supply and sewage-disposal works. Optional with Seniors in Civil Engineering. Five hours.

Two and a half credit hours

CE 34 Highway Design. A course in the drafting-room and laboratory to accompany CE 14. The design and location of highways. Optional with Seniors in Civil Engineering. Five hours.

Two and a half credit hours

CE 36 Railroad Design. A course in the drafting-room to accompany CE 12. The design of yards and structures in connection with the location of a railroad line. Optional with Seniors in Civil Engineering. Five hours.

Two and a half credit hours

ECONOMICS AND BUSINESS ADMINISTRATION

PROFESSOR GRIFFIN

Ec 1 Principles of Economics. The purpose of the course is to give the student a knowledge of the fundamental principles of economic science and to furnish a basis for the study of present-day problems. Readings and reports. Elective for Juniors and Seniors.

Three credit hours

Ec 2 Economic Problems. The following problems will be considered as thoroughly as time permits: (1) Money, credit, banking, the tariff, (3) labor problems, (4) monopolies and trusts, (5) socialism, and (6) taxation. Outside reading and reports. Elective for Juniors and Seniors.

Three credit hours

Ec 3 Agricultural Economics. A general course in economic principles and problems, with special reference to agriculture. Required of Seniors in Agriculture.

Three credit hours

Bus 1 Accounting and Commercial Law. Elective for all students, preferably Juniors and Seniors.

Three credit hours

Bus 2 Principles of Business Organization and Management, and Banking. Elective for all students, preferably Juniors and Seniors.

Three credit hours

Bus 3 Statistics, Insurance, and Transportation. Elective for all students, preferably Juniors and Seniors.

Three credit hours

Bus 4 Corporation Finance and Investments, Scientific Management, and Problems in Marketing. Elective for all students, preferably Juniors and Seniors.

Three credit hours

EDUCATION, PSYCHOLOGY, AND SOCIOLOGY

PROFESSOR WILKINSON

EDUCATION

Ed 1 Introduction to Teaching. This is a general survey course designed to give the student a preliminary acquaintance with the problems of teaching from the standpoint of the teacher. It includes a consideration of such topics as the organization of the school, nature and interests of pupils, value and selection of subject-matter, types of teaching, hygiene of pupils and school surroundings, class management and discipline. The class discussions are based on supervised observation in the practice school supplemented by assigned readings.

Three credit hours

Ed 4 Modern Educational Theory. An examination and comparison of the educational ideals embodied in the writings of Rousseau, Pestalozzi, Herbart, Froebel, Spencer, Dewey, McMurry, Bagley, and others. The purpose of the course is to lay a foundation for the construction of a theory of education that will serve to guide the student's judgment and practice.

Three credit hours

Ed 6 The High School. This course involves a brief history of secondary education, and a consideration of its aims, organization, and curriculum, with some attention to methods of teaching the various subjects.

Three credit hours

Ed 7 and 8 School Administration and Supervision. The three main divisions of this course are: (1) Units and types of school organization for administrative purposes; (2) Problems of school management, and (3) Supervision of instruction. The course aims to supply such technical

training along the lines indicated as is essential to the most efficient management of a school.

Six credit hours

PSYCHOLOGY

Psy 1 Psychology. This course aims to give the student such an insight into the factors and laws of human behavior as a teacher needs to possess. It includes a study of such topics as instincts and native capacities, methods and laws of learning, individual differences, and mental hygiene.

Three credit hours

Psy 3 The High School Pupil. The study of the psychology of adolescence, and the application of the facts learned to such matters as school discipline and government, student organizations and activities, vocational guidance, retardation, and elimination, etc.

Three credit hours

Psy 4 Mental Tests and Measurements. The course begins with a brief history of attempts to measure intelligence and educational achievement, and emphasizes the need for and value of such measurements in school work. Actual practice is given in the use of standard tests and scales.

Three credit hours

SOCIOLOGY

Soc 1 Introduction to the Study of Society. This course treats of the origins of society and of our present social institutions, and aims to lay a foundation for the scientific study of practical social problems.

Three credit hours

Soc 2 Practical Sociology. A course dealing primarily with social conditions, their causes, significance to society, and possible means of improvement. Among the topics treated the following receive special attention: family life, immigration, child labor, poverty, women in industry, the

modern city, care of dependents and defectives, crime and punishment, the negro, conservation of natural resources, public health, etc.

Three credit hours

Soc 4 Rural Sociology. This course considers the various factors leading to the sociological development of the United States with special reference to its rural phase. It involves a study of the eras of farming, composition and movements of population, community problems such as rural health, recreation, morality, etc., and the various social agencies through which changes may be effected.

Three credit hours

ELECTRICAL ENGINEERING

PROFESSOR KOERBER

EE 1 Direct Currents. Theory of the direct current dynamo; shunt, series, and compound wound field magnets; ring and drum windings; commutators; direct current motors. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. Two hours a week.

MR. ———— *Two credit hours*

EE 2 Direct Currents. Operation, regulation, and methods of testing dynamos and motors. Study of motor and dynamo characteristics. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. Two hours a week.

MR. ———— *Two credit hours*

EE 3 and 4 Alternating Currents. Inductance and capacity; harmonic electromotive force; single phase and polyphase circuits; alternating current instruments and machinery. Theory of single phase and polyphase induction motors; induction generators; synchronous motors and converters; and single phase commutator motors. Required of Seniors in Mechanical and Electrical Engineering. Three hours a week.

PROFESSOR KOERBER *Six credit hours*

EE 5 Electrical Engineering Seminar. Papers on assigned topics; lectures on recent advances in electrical

engineering; discussion of thesis work; discussion of articles in current engineering periodicals. Required of Seniors in Electrical Engineering. Two hours a week.

PROFESSOR KOERBER *Two credit hours*

EE 6 Telephones and Telegraphs. A study of modern telephone systems with a review of the earlier systems and developments. Required of Seniors in Electrical Engineering. Two hours a week.

PROFESSOR KOERBER *Two credit hours*

EE 7 Direct Currents. Direct current distribution; calculation of high and low tension lines; electric lamps and photomentry; details of outside wiring, with particular reference to the rules and regulations of the National Board of Fire Underwriters. Required of Seniors in Mechanical and Electrical Engineering. Two hours a week.

PROFESSOR KOERBER *Two credit hours*

EE8 Electric Railways. The construction, equipment, and operation of different types of electric railways. Required of Seniors in Electrical Engineering. Two hours a week.

PROFESSOR KOERBER *Two credit hours*

EE 11 Direct Currents. Theory and application of electrical machinery. Required of Juniors in Civil Engineering. Two hours a week.

MR. ———— *Two credit hours*

EE 31 and 32 Electrical Design. The calculation, design, and construction of direct and alternating current machinery. Required of Seniors in Electrical Engineering. Six hours a week.

PROFESSOR KOERBER *Six credit hours*

EE 41 and 42 Electrical Laboratory. Determination of characteristic curves; efficiencies and magnetic leakage of direct current dynamos and motors; life and efficiency tests of arc and incandescent lamps. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

PROFESSOR KOERBER *Three credit hours*

EE 43 and 44 Electrical Laboratory. Efficiencies and characteristic curves of alterators, synchronous motors, induction motors, and transformers. Required of Seniors in Electrical Engineering. Six hours a week.

PROFESSOR KOERBER *Six credit hours*

EE 45 and 46 Electrical Laboratory. Testing of alternating current machinery and apparatus. Required of Seniors in Mechanical Engineering. Three hours a week.

MR. ———— *Three credit hours*

ENGLISH

PROFESSOR SYPHERD, PROFESSOR DUTTON, ASSISTANT PROFESSOR MOORE, AND ASSISTANT PROFESSOR FOSTER

The courses in the Department of English are designed (1) to enable every student at graduation to express his ideas, orally or in writing, in accurate, clear, effective English; and (2) to give to students through required and elective work an acquaintance with the best authors in English and American Literature and an appreciation of good poetry and prose. All Freshmen are required to take Composition, which involves training in oral and written expression; all Sophomores, a general course in Literature, which treats writers, types, and movements. Seniors in Arts and Science and in Engineering are required to take an additional course in English. Elective courses in 1920-1921 will be No. 11, 13 and 14, 21, 24, 26, 36, and 39.

E 1 and 2 Composition. An elementary course which lays especial stress on accuracy and clearness in expression. Recitations, themes, practice in public speaking, conferences, and outside readings. Required of all Freshmen.

PROFESSOR SYPHERD, PROFESSOR DUTTON, ASSISTANT PROFESSOR MOORE, AND ASSISTANT PROFESSOR FOSTER *Six credit hours*

E 3 and 4 Literature. A study of selected English poems, first term; a study of the forms of English prose—drama, essay, novel, and short story—second term. Lectures, recitations, and reports. Required of all Sophomores in Engineering and Agriculture.

ASSISTANT PROFESSOR FOSTER *Four credit hours*

E 5 and 6 Literature. General Survey. A brief survey of the history of the English language and literature, followed by a more detailed and thorough study of the

main literary forms—narrative and lyric poetry, the drama, the novel, and the essay. Discussions, lectures, outside readings, reports, and conferences. Required of Sophomores in Arts and Science.

PROFESSOR DUTTON *Six credit hours*

E 7 and 8 Composition. Technical English for Engineers. In this course, students have practice in public speaking, and in the writing of business letters, reports, instructions, orders, specifications and contracts, and general engineering papers. Required of Seniors in Engineering.

PROFESSOR SYPHERD *Two credit hours*

E 9 and 10 Composition and Literature. A study of the English essay, with exercises in expository writing, first term; a study of the short-story in English, with exercises in narrative writing, second term. Required of Seniors in Arts and Science.

PROFESSOR SYPHERD *Four credit hours*

E 11 Composition. An advanced course in narrative and descriptive writing. Themes, outside reading, and conferences. Elective for Sophomores and Juniors in Arts and Science.

PROFESSOR DUTTON *Three credit hours*

E 13 and 14 Composition. Technical English for Agricultural students. A course in the writing of reports, newspaper articles, and theses, and in the preparation and delivery of speeches and addresses. Elective for Seniors in Agriculture.

PROFESSOR DUTTON *Two credit hours*

E 15 Literature. Victorian Poetry. This course is centered about the poems of Browning, Tennyson, Arnold, and Swinburne. The aim of the course is to obtain a knowledge of the poetry of the period, to study the poems as an expression of the philosophy of life of each of the poets, and to correlate this poetry with the social movements of the time. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 16 Literature. Nineteenth Century Novel. A study of the main novelists of the century: Scott, Dickens, Thackeray, Eliot, Meredith, and Hardy. Collateral reading in the contemporary novel. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 18 Literature. Romantic Movement. A study of the social, philosophical, and literary tendencies which are found in the prose and poetry written between 1798 and 1832. Elective for Juniors and Seniors. [Omitted in 1919-1920].

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 19 Shakspere. The Elizabethan stage; social, political, and literary conditions; a study of selected plays. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR MOORE *Three credit hours*

E 21 Literature. Modern Drama. Preliminary view of the English drama since Shakspere. Recent and contemporary European drama (Continental plays in translation). Elective for Juniors and Seniors. [Omitted in 1919-1920].

ASSISTANT PROFESSOR MOORE *Three credit hours*

E 24 Literature. Eighteenth Century. A course in the poetry and prose of the Eighteenth Century, including a study of Johnson and His Circle, Pope, Dryden, the founders of the English Novel, and the contributors to the Periodicals. Elective for Juniors and Seniors in Arts and Science. [Omitted in 1919-1920].

PROFESSOR DUTTON *Three credit hours*

E 26 Literature. Poetics. A study of English metrics and the principles of literary criticism, accompanied by an intensive study of selected poems. Discussions, lectures, conferences, outside readings, and reports. [Omitted in 1919-1920].

ASSISTANT PROFESSOR MOORE *Three credit hours*

E 28 Literature. A literary study of the Bible. Lectures, recitations, and reports.

PROFESSOR SYPHERD *Three credit hours*

E 32 Literature. Classics in Translation. A study of Greek and Roman classics which have influenced English Literature and English thought. Elective for Juniors and Seniors. [Omitted in 1919-1920].

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 34 Literature. A general survey of the field of American Literature from Franklin to the present time, and an intensive critical study of the most important work of the chief American poets and prose writers. Lectures, recitations, outside reading, and reports. Elective for Sophomores and Juniors.

PROFESSOR DUTTON *Three credit hours*

E 36 Literature. Chaucer. A critical and appreciative study of some of the Canterbury Tales and of the other poems of Chaucer. Elective for Juniors and Seniors. [Omitted in 1919-1920].

PROFESSOR SYPHERD *Three credit hours*

E 39 Literature. Emerson. A study of Emerson as poet, essayist, and philosopher. Elective for Juniors and Seniors. [Omitted in 1919-1920].

PROFESSOR DUTTON *Three credit hours*

HISTORY AND POLITICAL SCIENCE

PROFESSOR VAUGHN AND ASSISTANT PROFESSOR GREENFIELD

The courses in this Department are arranged in the approximate order in which they should be taken by the student. In the first two years certain courses are required; all other courses are elective for properly qualified students. Sophomores may, with permission of the Department, elect courses from 9 to 16 in addition to the required work. Courses 9 to 16 will be given in alternate years. Courses 9, 10, 11, and 12, are omitted in 1919-1920.

H 1 and 2 Modern and Contemporary Europe. An introductory course dealing with the history of Europe from the close of the Napoleonic Wars to the present time, with special emphasis on the period since 1870. Required of Freshmen in Arts and Science.

ASSISTANT PROFESSOR GREENFIELD *Six credit hours*

H 3 History and Government of Delaware. The aim of this course is to give a general view of the history of Delaware as colony and state and also to outline the main features of its government. Required of Freshmen in Engineering and Agriculture.

PROFESSOR VAUGHN *One credit hour*

H 5 History of the United States (1763-1848). An advanced course in American history, embracing a study of the Revolutionary period, the formation of the Constitution, foreign relations, early national development, Jacksonian democracy, westward expansion, and the Mexican War. Required of Sophomores in Arts and Science and in Civil Engineering.

PROFESSOR VAUGHN *Three credit hours*

H 6 History of the United States (since 1848). A continuation of H 5 dealing with the slavery controversy, the Civil War, reconstruction problems, material development, and contemporary history and problems. Required of Sophomores in Arts and Science and in Civil Engineering.

PROFESSOR VAUGHN *Three credit hours*

H 9 History of England (to 1688). A general study of the development of the English people—political, social, institutional, and literary—from the earliest times to the Revolution of 1688. Readings and reports. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Three credit hours*

H 10 The British Empire. This course is a continuation of H 9. It embraces a survey of English history since the Revolution of 1688 as a basis for special study of the expansion of England into Greater Britain and of the problems of the Empire. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Three credit hours*

H 11 Mediaeval Europe. A general survey of European history, institutions, and culture from the downfall of Rome to the close of the Middle Ages. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 12 The Renaissance and Reformation. The political background of the period is studied but special emphasis is laid on social and economic conditions, the developments in art and literature, and the causes and results of the Protestant revolt. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 13 The French Revolution and Napoleon. A special study of the Revolutionary era: the characteristics of the Old Regime, the philosophers and economists, the course of the Revolution, the rise of Napoleon, and the wars of the Empire. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 14 Modern Russia. A history of Russia in the modern period, an appreciation of Russian institutions and culture, and a study of contemporary revolutionary movements. Russia's relation to Near Eastern problems will be emphasized. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 15 China and Japan. A brief study of the history and problems of the Far East with special reference to China and Japan. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 16 History of Rome. An advanced course in Roman history for classical students and for those planning to teach history in high schools. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR GREENFIELD *Three credit hours*

H 21 and 22 American Government. A general course dealing with the organization and activities of our American government—both national and state. Considerable stress is placed upon practical problems and present-day developments. Required of Seniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

PROFESSOR VAUGHN *Six credit hours*

H 27 and 28 Studies in Delaware History. An advanced course which offers opportunity to develop special topics in the social, economic, and political history of the

state. The aim is partly information and partly training in research work. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Four or six credit hours*

H 29 and 30 Research Course. The student may select his topic for investigation from any of the fields of work outlined above. Elective for Seniors.

PROFESSOR VAUGHN *Six credit hours*

HORTICULTURE

PROFESSOR MCCUE

Courses 16, 17, 18, and 33 are required of all students in Agriculture.

A student specializing in Horticulture will be expected to take nearly all the courses offered by the Department. Students who major in Horticulture are expected to elect courses 5 and 6 in Biology and course 2 in Plant Pathology.

The college is very fortunately located for the study of Horticulture. The fruit and vegetable growing centers of the State are easily accessible. Many famous fruit and truck growing districts in neighboring states are distant but a few hours' ride. The cold storage houses and the large markets of Philadelphia can be reached in an hour's time, and a famous greenhouse district of Pennsylvania lies only a few miles north of Newark. The earnest student will have many opportunities to see the practical growing, harvesting, and marketing of Horticultural crops.

The Experiment Station possesses about forty acres of orchards and gardens, that can, to a limited extent, be used for purposes of instruction. All the tree, vine, and bush fruits that can be grown in the State are found in the College Orchards. A small amount of land is also available for the use of students in vegetable gardening. A small greenhouse is available for instructional purposes.

Hort 16 Plant Propagation. (Prerequisite: B 7, 8). A discussion of the principles governing the propagation of plants by seeds, buds, grafts, layers, and cuttings. Required of all Freshmen in Agriculture. Two recitations and two laboratory hours. Fee $1.00.

PROFESSOR MCCUE *Three credit hours*

Hort 17 Pomology. (Prerequisite: Hort 16). A general course in fruit growing designed to meet the needs of those students who do not wish a detailed technical course in orcharding. Required of all Sophomores in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 18 Vegetable Gardening. (Prerequisite: Hort 16). A study of the location of vegetable gardens and truck farms. Soil, cultural, and fertilizer requirements of the principal trucking crops. A study of the construction and management of hot beds and cold frames. Each student is required to plan, plant, and cultivate a small garden. Trips of inspection are required. Required of Sophomores in Agriculture. Two recitations and two laboratory hours. Fee $1.00.

PROFESSOR MCCUE *Three credit hours*

Hort 19 Forestry. (Prerequisite: B 7, 8). A brief introductory course in Forestry. The course embraces a discussion of the handling of wood lots, care and protection of the forests, forest mensuration, and studies of the forest trees of the U. S. Elective for Juniors and Seniors in Agriculture.

PROFESSOR MCCUE *Three credit hours*

Hort 20 Pomology. (Prerequisite: Hort 17). Commercial Pomology. A course designed to deal with the details of fruit production, both from the practical and scientific standpoints. Special emphasis is placed upon spraying. Elective for Juniors in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 21 or 22 Landscape Gardening. (Prerequisites: B 7, 8; Hort 16). This course gives a discussion of the laws of ornamental gardening, planning and making lawns, grouping of trees and shrubbery, and the comparisons between the formal and naturalistic styles of gardening. Elective for Juniors and Seniors in Agriculture. First or second term. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 23 Advanced Pomology. (Prerequisites: B 7, 8; Hort 16, 17, and 20). A continuation of course 20. Elective for Seniors in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 24 Breeding of Horticultural Plants. (Prerequisites: Hort 16, 17, 18, 20, and 33). A study of the application of the laws of heredity to economic horticulture. Elective for Seniors in Agriculture.

PROFESSOR MCCUE *Three credit hours*

Hort 25 or 26 Small Fruits. (Prerequisites: Hort 16 and 19). A discussion of the commercial production of strawberries, raspberries, gooseberries, and currants. Elective for Juniors and Seniors in Agriculture. First or second term.

PROFESSOR MCCUE *Three credit hours*

Hort 28 Forcing Crops. (Prerequisites: Hort 16 and 18; B 5, 6, 7, 8, and Pl Path 2). A study of greenhouse crops, both vegetable and floral, and greenhouse construction. Elective for Seniors in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 29 Systematic Pomology. (Prerequisites: Hort 17 and 20). A study of the systematic relationship of the cultivated fruits of the United States. Identification, description, and judging of the common commercial varieties of apples, pears, plums, grapes, and peaches grown in America. Elective for Seniors in Agriculture. [Omitted in 1919-1920]. One recitation and four laboratory hours. Fee $1.00.

PROFESSOR MCCUE *Three credit hours*

Hort 31 and 32 Horticultural Seminar. A study of the literature of horticulture, both past and present, and current events of horticultural interest. Required of all Senior students majoring in Horticulture.

PROFESSOR MCCUE *Two credit hours*

Hort 33 Genetics. (Prerequisite: B 7, 8). A brief course discussing the foundation principles and the various theories of heredity. Required of Seniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

PROFESSOR MCCUE *Three credit hours*

MATHEMATICS

PROFESSOR HARTER, PROFESSOR SHORT, PROFESSOR CULLIMORE, AND ASSOCIATE PROFESSOR CUMMINGS

M 1 Solid Geometry. Required of Freshmen in Arts and Science.

Two credit hours

M 3 Plane Trigonometry. Required of Freshmen in Arts and Science and in Agriculture.

Two credit hours

M 4 College Algebra, including review of elements. Required of Freshmen in Arts and Science.

Three credit hours

M 5 Analytical Geometry. (Prerequisites: M 16, M 3, M 4). Required of Sophomores in Engineering; elective for others.

Four credit hours

M 6 Differential and Integral Calculus. Fundamental principles and applications. Required of Sophomores in Engineering; elective for others.

Four credit hours

M 7 and 8 Differential and Integral Calculus; Differential Equations. (Prerequisites: M 6). Required of Juniors in Civil, Mechanical, Electrical, and Chemical Engineering courses; open for election to all other qualified students.

Six credit hours

M 9 and 10 General Astronomy.

Six credit hours

M 11 and 12 Theoretical Mechanics. (Prerequisite: M 7 and 8).

Ten credit hours

M 13 Method of Least Squares. (Prerequisite: M 7 and 8).

Two credit hours

M 15 Plane Trigonometry and Elements of Algebra. Required of Freshmen in Engineering.

Four credit hours

M 16 Spherical Trigonometry and College Algebra. Required of Freshmen in Engineering.

Four credit hours

M 18 Spherical Trigonometry. Required of Freshmen in Arts and Science.

One credit hour

M 20 Victor Analysis. (Prerequisite: M 7 and 8).

Two credit hours

MECHANICAL ENGINEERING

PROFESSOR M. VAN G. SMITH, PROFESSOR RYAN, ASSOCIATE PROFESSOR BANKS, AND MR. COYLE

ME 2 Elements of Steam Engineering. A general description of engines and boilers; their fundamental principles; detailed description of their parts; the reasons for using various elements of construction; practice in the use of an engineering vocabulary; freehand sketches of various parts of engines and boilers; problems. Required of all Juniors in Engineering. Three hours a week.

PROFESSOR SMITH *Three credit hours*

ME 3 and ME 4 Thermodynamics. The fundamental laws of the mechanical theory of heat, and their application to gases, saturated and superheated vapors; the theory of steam, air, and gas engines, and refrigeration machines. Required of Seniors in Mechanical Engineering. Two hours a week.

PROFESSOR SMITH *Four credit hours*

ME 5 and ME 6 Steam Engines and Boilers. The principles, theory, and construction of the steam engine. The fundamental principles of steam turbines. Power

plant auxiliaries. Steam boilers; their principles, design, and construction. Required of Seniors in Mechanical and Electrical Engineering. Four hours a week.

PROFESSOR SMITH *Eight credit hours*

ME 7 Gas Engines. The theory and principles of the gas engine; its construction and operation; gas producers. Required of Seniors in Mechanical and Electrical Engineering. Two hours a week.

PROFESSOR SMITH *Two credit hours*

ME 8 Steam Turbines. A further consideration of their theory and construction. A continuation of ME 6. Required of Seniors in Mechanical Engineering. Two hours a week.

PROFESSOR SMITH *Two credit hours*

ME 21 and ME 22 Descriptive Geometry. The solution of problems relating to points, lines, planes, and surfaces, with practical applications. Recitations and drawing. Required of all Freshmen in Engineering. Two hours a week.

ASSOCIATE PROFESSOR BANKS *Four credit hours*

ME 23 and ME 24 Mechanical Drawing. The care and use of instruments and materials; outlining; principles of outline shading; section lining; projections; lettering; intersection and development of surfaces. Required of all Freshmen in Engineering. Three hours a week.

ASSOCIATE PROFESSOR BANKS *Three credit hours*

ME 25 and ME 26 Mechanical Drawing. Free hand sketching; detailed working drawings and assembly drawings; tracing; blue printing; use of handbooks. Required of all Sophomores in Engineering. Three hours a week.

ASSOCIATE PROFESSOR BANKS *Three credit hours*

ME 28 Mechanical Drawing. Extension of course ME 26; drawing from empirical formulas; methods of laying out cams, gear wheels, and other mechanical contrivances. Required of Sophomores in Mechanical and Electrical and Chemical Engineering. Three hours a week.

ASSOCIATE PROFESSOR BANKS *One and a half credit hours*

ME 29 and ME 30 Kinematics. The laws of motion; combinations of pure mechanism; rolling and sliding contact; velocity diagrams; linkwork; cams; pulleys; forms of gear teeth. The general theory of slide valve and link motions. The application of the Zeuner diagram to the design of the principal slide-valve gears. Required of Juniors in Mechanical and Electrical Engineering. Two hours' recitation and two hours' drafting a week.

ASSOCIATE PROFESSOR BANKS *Six credit hours*

ME 31 and ME 32 Machine Design. The principles of the design of machinery; their application to the design of special parts, comprising the calculation of all stresses and the necessary distribution of metal to withstand them; properties and uses of materials; the use of handbooks. Classroom work, lectures, and drafting. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH *Six credit hours*

ME 41 and ME 42 Experimental Engineering. The methods of measuring power; standardization and calibration of instruments; brake and dynamometer tests; efficiency tests of engines, boilers, steam pumps, blowers, and condensers; calorific value of fuels; tests of the common constructive materials. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH *Six credit hours*

ME 43 and ME 44 Experimental Engineering. A course similar to ME 42. Required of Seniors in Electrical Engineering. Three hours a week.

PROFESSOR SMITH *Three credit hours*

ME 51 and ME 52 Carpentry and Wood Turning. The care and general use of wood-working tools; exercises in carpentry; exercises in wood-turning; practical instruction in firing steam boilers and the operation of steam engines. Required of all Freshmen in Engineering. Three hours a week.

MR. COYLE *Two credit hours*

ME 53 and ME 54 Metal Work and Forging. Exercises in metal turning, facing, boring, planing, drilling, thread cutting, and milling; the use of metal-working hand tools, chipping, and filing; forging and tool dressing; the construction of machine parts, finishing, and assembling; management of steam engines and boilers. Required of Sophomores in Mechanical and Electrical Engineering. Three hours a week.

PROFESSOR RYAN *Two credit hours*

ME 55 and ME 56 Pattern Making and Founding. The principles of making simple patterns, core-boxes, and patterns for machine parts; core-making; dry sand moulding and casting. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

PROFESSOR RYAN *Two credit hours*

ME 57 Metal Working and Forging. A course similar to ME 53 and ME 54. Required of Sophomores in Chemical Engineering. Three hours a week.

PROFESSOR RYAN *One credit hour*

ME 59 Supplementary Term in Shopwork. The work done during the term is the same as that described under ME 53 and ME 54. The term begins the day after Commencement each year and lasts two weeks. Required of Sophomores in Mechanical, Eelctrical, and Chemical Engineering.

PROFESSOR RYAN *Two credit hours*

MILITARY SCIENCE AND TACTICS

WARD E. DUVALL, *C. A. Major*

The Reserve Officers Training Corps Unit (infantry) at this Institution is for the purpose of qualifying students to be company officers of infantry.

The advanced course is elective and for Juniors and Seniors only.

Students must have two years' military training to be eligible to tae thke the advanced course and must sign a contract with the Govment to continue the course for two years or unless sooner graduated or dismissed from the college.

The Government agrees to pay each student in the advanced course $.40 a day or $2.80 a week for the entire academic year.

The Government also agrees to furnish every member of the R. O. T. C. unit with a complete uniform of olive drab woolen shirt, shoes, hat, and leggings.

BASIC COURSE

FRESHMAN YEAR

Mil 1 and 2 Three hours a week.

Three credit hours

SOPHOMORE YEAR

Mil 3 and 4 Three hours a week.

Three credit hours

JUNIOR YEAR

Mil 5 and 6 Three hours a week.

Three credit hours

SENIOR YEAR

Mil 7 and 8 Three hours a week.

Three credit hours

ADVANCED COURSE

JUNIOR YEAR

Mil 9 and 10 Five hours a week.

Five credit hours

SENIOR YEAR

Mil 11 and 12 Five hours a week.

Five credit hours

MINERALOGY AND GEOLOGY

PROFESSOR PENNY

Mineralogy is taught by means of recitations and lectures, followed by laboratory work on the determination of the different species of minerals. The course is three hours for one term.

Geology is taught by means of recitations and lectures. The course is three hours for one term.

Mi 31 Mineralogy. This course treats of the physical, morphological, and chemical properties of minerals and especially of the occurrence and recovery of the useful minerals. Recitations and laboratory practice.

Three credit hours

Mi 32 Geology. This course treats of dynamical, structural, and historical geology. Recitations and lectures.

Three credit hours

MODERN LANGUAGES AND LITERATURES

PROFESSOR E. L. SMITH, ASSISTANT PROFESSOR SPIKER, ASSISTANT PROFESSOR SALESKI, AND ASSISTANT PROFESSOR MAUBERT

French and German are among the required subjects of study, and Spanish and Italian are offered to those who wish to elect them. With the approval of the Faculty any year or years of this work may be elected by a student in addition to the amount required in his course.

The aim of the courses offered in Modern Languages is to provide elementary and intermediate instruction in German, French, Spanish, and Italian. Students who have completed commendably the courses offered in these languages may expect to possess a good pronunciation, an accurate reading knowledge of the language, and an acquaintance with the more important modern authors and some familiarity with the more important literary groups and movements. The scientific and commercial aspects of the languages receive due attention but without overlooking the more important cultural values. An effort is made to acquaint the student with the several European civilizations from the linguistic and literary point of view, and to inspire in him such a love for these languages and literatures as will be a source of pleasure and intellectual growth.

FRENCH

ML 1 and 2 French Elements. Stress is laid on accurate pronunciation. Practice in the use of phonetic symbols. The essentials of grammar, including the irregular verbs. Reading of easy modern French prose. Oral and written exercises. Dictation. Fraser and Squair, French Grammar. Aldrich and Foster, French Reader. Labiche et Martin, Le Voyage de Monsieur Perrichon.

Six credit hours

ML 3 and 4 Advanced French. Study of the seventeenth century dramatists, especially Corneille, Racine, and Molière. French prose of the seventeenth century.

Six credit hours

ML 5 and 6 General Survey of French Literature. A general survey of French literary activity from 1600 to 1850. Some careful reading and translation from representative literary masterpieces in class. Lectures, collateral reading, and reports.

Six credit hours

ML 7 and 8 Nineteenth Century. Philosophy, history, criticism, drama, fiction, and poetry. Chateaubriand, Mme. de Staël, Hugo, Sainte-Beuve, Thierry, Merimée, Balzac, Lamartine, Beranger, Musset, Dumas père, Dumas fils, Scribe, Michelet, Thiers, Gautier, Sand, Renan, Taine, Augier, Sardou, Brunetière, Lemaitre, Faguet, Daudet, Zola, Maupassant, France, Loti, Coppée, de Vigny, Rostand. Lectures, collateral reading, and reports.

Six credit hours

SPANISH

ML 21 and 22 Elementary Spanish. Stress is laid on accurate pronunciation, mastery of elements of grammar, and the acquisition of vocabulary. Oral and written exercises. Reading of easy modern Spanish prose. Composition and conversation. Hills and Ford, Spanish Grammar. DeVitis, Spanish Reader. Crawford, Spanish Composition. Gil Blas.

Six credit hours

ML 23 and 24 Advanced Spanish. Attention will be given to both practical and literary ends. Conversation and composition in Spanish throughout the year. Humphrey's Spanish Prose Composition. During the first half of the year representative plays and novels from the nineteenth century will be read and studied. During the second half either Cervantes' Don Quixote or the dramas of Lope de Vega and Calderon will be studied. Lectures, readings, and reports.

Six credit hours

ITALIAN

ML 41 and 42 Elementary Italian. Study of Italian grammar with oral exercises in elementary composition.

Grandgent, Italian Grammar. Easy reading in modern Italian.

Six credit hours

ML 43 and 44 Advanced Italian. Reading of more difficult Italian prose. Dante, La Divina Commedia.

Six credit hours

GERMAN

ML 61 and 62 Beginners' German Course. Grammar, reading, composition, conversation. No credit will be given for less than the full course. [Omitted in 1919-1920 and 1920-1921].

Six credit hours

ML 63 and 64 First Year College German. For those who have completed two years of high school German or ML 61 and 62. Grammar, reading, composition, conversation. Thomas, Practical German Grammar; Thomas and Hervey, German Reader; Baumbach, Die Nonna; Freytag, Die Journalisten; Heyse, Das Maedchen von Treppi. No credit will be given for less than the full course.

Six credit hours

ML 65 and 66 Second Year College German. ML 65 is prerequisite to all the German courses following. Reading, composition, conversation. Credit will be given for either half only by special arrangement.

Six credit hours

ML 71 and 73 Goethe. (Prerequisite: ML 65). Conducted mainly in German. [In 1919-1920 ML 71 will be omitted; in 1920-1921 both ML 71 and 73 will be omitted; in 1921-1922 ML 73 will be omitted].

Each, Three credit hours

ML 72 Lessing. (Prerequisite: ML 65). [Omitted in 1919-1920 and 1921-1922].

Three credit hours

ML 74 Schiller. (Prerequisite: ML 65). Conducted mainly in German. [Omitted in 1920-1921 and 1921-1922].

Three credit hours

ML 76 The German Drama since Goethe. (Prerequisite: ML 65). Conducted mainly in German. [Omitted in 1919-1920 and 1920-1921].

Three credit hours

ML 78 German Prose since Goethe. (Prerequisite: ML 65). Conducted mainly in German. [Omitted in 1920-1921 and 1921-1922].

Three credit hours

ML 80 German Lyric Poetry since Goethe. (Prerequisite: ML 65). Conducted mainly in German. [Omitted in 1919-1920 and 1920-1921].

Three credit hours

ML 81 Middle High German. (Prerequisite: ML 65). Conducted mainly in German. [Omitted in 1919-1920 and 1921-1922].

Three credit hours

ML 82 Scientific German. (Prerequisite: ML 65). [Omitted in 1919-1920 and 1921-1922].

Three credit hours

PHYSICAL TRAINING

Assistant Professor McAvoy and Mr. Shipley

PT 1 and 2 Physical Training. Outdoor and indoor exercises. One hour. Required of all Freshmen.

One credit hour

PT 3 and 4 Physical Training. Athletic exercises. One hour. Required of all Sophomores.

One credit hour

PHYSICS

Professor Harter and Professor McGougan

Ps 1 Mechanics, Heat, and Sound. The fundamental principles of these subjects are studied chiefly from the experimental standpoint. Lectures and recitations. Three hours per week. Required of Sophomores in Agriculture and elective for all students in Arts and Science.

Three credit hours

Ps 2 Light, Electricity, and Magnetism. A continuation of Ps 1.

Three credit hours

Ps 3 Physical Laboratory. Introduction to instruments and methods used in the Physical Laboratory. Experiments in Mechanics and Heat. Given in connection with Ps 1. One three-hour exercise per week.

One and a half credit hours

Ps 4 Physical Laboratory Experiments in Sound, Light, and Electricity. Given in connection with Ps 2. One three-hour exercise per week.

One and a half credit hours

Ps 5 and Ps 6 General Physics. A thorough course in the fundamentals of physics, including the solution of problems. Lectures and recitations. Five hours per week. For Sophomores in Engineering.

Ten credit hours

Ps 7 and Ps 8 Physical Laboratory. An introduction to methods and instruments used in Physical Laboratory. Experiments in Mechanics, Heat, Electricity, Sound, and Light. Given in connection with Ps 5 and Ps 6. One three-hour exercise per week.

Three credit hours

Ps 10 Advanced Physics. A second course in Physics offered to properly qualified students in any department or year. Lectures, recitations, and laboratory work.

Three and a half credit hours

PLANT PATHOLOGY

ASSOCIATE PROFESSOR LECATO

Pl Path 2 Plant Pathology. (Prerequisites: B 7 and 8; Ba 1 and 2). An elementary course covering the principal bacterial and fungous diseases of the more important economic plants, with special emphasis on orchard and trucking diseases. Students will be expected to learn to recognize the more important diseases and to prescribe

treatment. Some attention will be given to isolating and culturing parasitic bacteria and fungi. Frequent trips will be made to study diseases under field conditions. Each student will be required to make a collection of 25 diseased specimens.

Elective for students in Arts and Science and required of Juniors in Agriculture. One hour lecture and four hours' laboratory.

Three credit hours

SOIL BACTERIOLOGY

PROFESSOR MANNS

SB 2 Soil Bacteriology. (Prerequisites: Bacteriology 1, 2; Chemistry 45, 46). The course covers a study of the economic importance of the invisible but highly active soil organisms. These organisms, the bacteria, fungi, and protozoa, have been shown in recent years to play an active part in soil fertility. A study will be made of their work in relation to ammonification, nitrification, and denitrification; the influence of cropping and tillage on the flora; the economic use of fertilizers and lime; bacteria in relation to the fixation of nitrogen by legumes.

The laboratory work will consist of a quantitative and qualitative study of the types of flora, i. e., the ammonifiers, nitrifiers, nodule organisms, and some parasitic fungi from sick soils; measuring the rate of nitrification, fixation of atmospheric nitrogen, and ammonification in different soils variously manured, fertilized, and limed.

Elective for Seniors in Arts and Science and required of Seniors in Agriculture. One hour lecture and four hours' laboratory. Second term.

Three credit hours

GENERAL INFORMATION

EXPENSES

Tuition

Tuition is free to students from the State of Delaware. The tuition for all other students is $25 a term or $50 for the year.

Fees

	First Term	*Second Term*
INCIDENTAL EXPENSES	$25.00	$25.00
Use of Library		
Use of Gymnasium		
Athletics		
Infirmary		
Ordinary "wear and tear"		
LABORATORY		
Shop		
Freshman year	3.75	3.75
Sophomore year	5.25	5.25
Junior year	3.75	3.75
Chemistry	7.50	7.50
Zoology	1.25	1.25
Botany	1.25	1.25
Soil Bacteriology		2.50
Plant Pathology		1.00
Agronomy, 1, 2, 3, 8, each		1.00
Agronomy, 4, 5, each		2.50
Bacteriology	2.50	2.50
Electrical Engineering		
Junior year	6.00	6.00
Senior year	6.00	6.00

MATRICULATION

A fee of $5.00 is charged to each student on entering college. This fee is collected but once.

Rooms and Board

Rooms. Rooms may be obtained in the new Dormitory, Harter Hall, as follows:

Single room	$60.00 to	$70.00	each	student
Double room	37.50 to	42.50	"	"
Suite for two with study room	70.00 to	80.00	"	"

Rooms in Harter Hall are of three classes—single, double, and en suite. The College provides for each student a bed, chiffonier, study table, and two chairs. Other furnishings, including bed clothes and linen, must be provided by the student. All rooms are heated with steam and lighted with electricity.

Applications for rooms for 1919-1920 should be made to Mr. A. G. Wilkinson, Secretary of Business Administration. Rooms must be engaged for the entire year. A deposit of $5.00 must be made when a room is rented. It is recommended that rooms be engaged not later than the month of June.

Board. ALL RESIDENT STUDENTS, EXCEPT THOSE WHO LIVE IN THEIR OWN HOMES, ARE REQUIRED TO BOARD IN THE COLLEGE DINING HALL. Board in Old College, specially equipped with all comforts including Lounge and Club rooms, costs $6.25 per week, with Dining Room Service. The Commons is being run on a cost basis, and any material reduction in the cost of food will therefore mean an immediate reduction in price.

Estimated Total Expenses

The usual expenses for the year of a Freshman from the State of Delaware who boards in Newark may be estimated approximately as follows:

Matriculation	$5.00
Incidental expenses	50.00
Board, 38 weeks at $6.25 per week	225.00
Room	60.00
Books	12.00
Laundry	18.00
Other incidentals (personal expenses)	25.00
Total	$395.00

For a student in Agriculture, $2.50 should be added for charges in Botanical Laboratory. For a student in Engineering, approximately $25 should be added for draughting instruments and Shop charges. Each student in the Military Department pays $12 for his uniform. For a student coming from another state, $50 should be added for Tuition. Additional laboratory fees are as follows: Agronomy, 1, 2, 3, and 8, $1.00 each; Agronomy, 4 and 5, $2.50 each, with a deposit of $5.00 for breakage; Plant Pathology, $1.00; Soil Bacteriology, $2.50.

Juniors and Seniors in the Reserve Officers Training Corps receive forty cents a day for subsistence.

Payments

The matricuation fee of $5.00 must be paid at the time of registration.

The college bill for the first term is due and payable at the opening of the college year; the bill for the second term, at the opening of the second term. In order to be admitted to classes and laboratories, students must present to the Instructors in charge the Treasurer's receipt for the payment of the fixed charges of the college.

Bills for board are due and payable as follows: one-half of the first term bill at entrance and one-half before November 1; one-half of the second term bill at the opening of the second term and one-half before March 15. No refund will be made unless a student is obliged to leave college during the term.

Room rent for the entire year is payable at the opening of the college year.

Registration

Application for admission to college should be made to the Secretary of the Faculty before Tuesday, September 16, 1919. Candidates for admission to the Freshman class are advised to submit their applications and credentials at the time of the Entrance Examinations in June or dur-

ing the summer preceding the college year in which they wish to enter. Sophomores, Juniors, and Seniors should register on or before Thursday, September 18, 1919.

Advisers

An adviser for each ten members of the Freshman Class is appointed by the President at the beginning of each academic year. The advisers for the other classes are appointed by the President at the close of each academic year from a list of men chosen by the respective classes.

Attendance

Regular attendance is required at all college exercises. Suitable rules governing absences have been adopted and any student not observing them will be dropped from the college. Punctual return to the college after vacation or at the beginning of a term is insisted upon. All absences immediately preceding or following a vacation are counted double.

All work missed by reason of necessary absences must be made up to the satisfaction of the professor concerned; otherwise the student will be marked zero for each exercise missed.. The privilege of making up work will not be granted after an unexcused absence.

Religious Instruction

The college is in no sense sectarian, but every student is expected to attend public worship at least once each Sunday at such place as parent or guardian may select.

Infirmary

To aid in caring for the health of the students, the college has established an Infirmary. In the building are four rooms for ordinary cases, two rooms for contagious diseases, and an office for first aid. The work of the infirmary is in charge of Miss Rosalie Pié, a trained nurse.

Examinations

Examinations in all subjects are held at the close of each term and are conducted either in writing, or orally, as the nature of the subject may require or as the professor may prefer. Review examinations are also held at

other times whenever, in the judgment of the professor, the objects of instruction may be promoted by such means. The examinations are designed not as a mere test of the student's knowledge, but as a valuable training in rapid, concise, and accurate expression. They serve as a valuable means of giving the student a ready command of his mental powers, and, by encouraging a review of a period of work, they give him a broader view and a firmer hold of the several subjects of study.

The Honor System was adopted by the student body in 1916.

In determining a student's fitness to proceed to a higher class great weight is given to the character of his performance of recitation room duties. The results of the term examinations are combined with the recitation records; but in fixing the student's standing the quality of his recitation work is the weightier factor.

No student will be promoted unless he has completed three-fourths of the work of his class of the year just passed and has no condition in previous years unsatisfied.

Re-examinations

Students who fail in an examination in any subject are required to pay a fee of one dollar for a re-examination. In order to be admitted to a re-examination students must present to the examiner a certificate properly signed showing that the fee has been paid. The money arising from this source will be expended for books for the general library.

Elective Studies

Students in Arts and Science must submit to the proper authorities, on or before May 15 of each academic year, schedules showing elective courses for the following year.

Reports

At the close of each term a report of the student's general combined recitation and examination record will

be sent to his parents or guardian. These reports show the course of study the student is pursuing and the class in which he is enrolled. Parents are urged to give these reports close attention, and, when the reports indicate any lack of attention to duty, to co-operate with the Faculty in correcting habits of idleness and indifference.

Student's Self-Aid

A committee of members of the Faculty helps to secure employment for students who depend on their own resources. All students wishing to avail themselves of opportunities thus offered are required to register with the chairman of the committee, Professor G. E. Dutton.

PRIZES AND SCHOLARSHIPS

The Bishop Coleman Memorial Prize

The Bishop Coleman Memorial Prize of twenty-five dollars is offered annually to the member of the graduating class having in all respects the best standing in the Senior year.

The Alumni Prize

A silver cup is offered by the Alumni Association to be competed for in an Annual Debate between teams representing the Freshman and Sophomore classes. This cup will become the property of the class which wins two debates.

Lieutenant Clarke Churchman Memorial Prize

The Delaware Daughters of the American Revolution and friends of Lieutenant Clarke Churchman have established a "Lieutenant Clarke Churchman Memorial Fund," the income from which is to be used for the encouragement of military virtues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in the military department. The prize derived from this fund amounts annually to twenty-five or thirty dollars.

The Philo Sherman Bennett Prize

The Hon. William Jennings Bryan, in carrying out the will of Philo Sherman Bennett, Esq., late of New Haven, Connecticut, has designated Delaware College as one of the twenty-five colleges or universities to receive its share of an endowment of ten thousand dollars to be invested and the proceeds to be applied to the payment of an annual prize "for the best essay discussing the principles of free government." Delaware College has accordingly received four hundred dollars in trust for this purpose, and from the income derived from this sum an annual prize will be awarded to the undergraduate student who presents the best essay in the fields prescribed. The income from this fund yields an annual prize of twenty to twenty-five dollars.

The William D. Clark Prize for Mathematics

The late Miss Julia Newton Clark, in memory of her father, William D. Clark, offered a prize of twenty-five dollars to be awarded at the end of the Sophomore year to the student who had shown the greatest proficiency in Mathematics during his Freshman and Sophomore years. Since her death this prize has been given by Miss Emma Clark.

Trustee Prize

A prize of fifty dollars is offered by a Trustee to the Junior who, during the first three years of his course, has maintained the highest general average of proficiency in all college activities, such as The Review, Literary Society, Y. M. C. A., the Agricultural Club, Athletics, Orchestra, and Courses of Study.

Only those students who have spent three years in residence at Delaware College will be considered.

The State Grange Prize

For the purpose of encouraging a high standard of work in the Agricultural courses, the Delaware State Grange has offered three cash prizes of fifteen dollars, ten

dollars, and five dollars in gold to be awarded respectively to the three students pursuing the course in Agriculture who have mainfested the greatest interest, and made the greatest progress in their work during the year for which the prizes are awarded.

The Francis A. Cooch Botanical Prizes

To promote interest in botanical studies, Mr. F. A. Cooch, '93, has offered two cash prizes of fifteen and ten dollars respectively to students in B4 making the best and second best collection of flowering plants, ferns, and their allies native to the State of Delaware.

Old Home Prize (*William H. Purnell Memorial*)

This prize was established by persons interested in the life, history, and biography of the Delmarvia peninsula, and made a memorial to President Purnell. The annual income from a fund of $500 is available for this prize, to be awarded for the best essay on some phase of the history of Delaware or the "Eastern Shore." It is open to all students. Successful essays will be read by title on Commencement Day and will be bound and filed in the College Library. Essays of sufficient merit may be published. Rules for the guidance of contestants will be posted.

Edward Reynolds Memorial

Three prizes of $25, $15, and $10 respectively are offered by Mrs. E. W. Reynolds to the students in chemistry who submit the best essays on chemical subjects. Seniors, Juniors, and Sophomores may compete for these prizes.

Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware

A scholarship amounting to $100 annually was founded in 1914 by the Harvard, Princeton, and Yale Clubs of Delaware. It will be awarded to a deserving Delaware boy. The appointment is made for one year only, but the incumbent for any one year may be reappointed.

The Robert Bayne Wheeler Scholarship

Mrs. Robert Bayne Wheeler has given to the college $2500, the income from which, amounting to about $125, is to be given annually to a deserving Delaware boy to whom this amount will be of service in helping him to obtain an education.

Du Pont Scholarships

For the purpose of encouraging young men to specialize in chemistry, the E. I. du Pont de Nemours and Company offers two scholarships of $300 each to Senior students in chemistry.

THE TATUM MEMORIAL LECTURE FUND

Mr. Ashton R. Tatum, a friend of the College, at his death left a fund of $1000, the income from which is to be devoted to lectures on the treatment and care of horses.

LIBRARIES

The combined libraries of the college contain about 23,000 volumes.

Each department of instruction has its own library of reference works in its classroom or laboratory, under the immediate supervision of the professor in charge, from whom students may obtain books for use in connection with their work.

The general library, in which are most of the books on literature, history, economics, philosophy, etc., is, together with the reading-room, open to students from 8.15 a. m. to 10 p. m.

The library has been designated as one of the depositories for the public documents of the United States Government and from this source receives many valuable publications.

Several friends of the college have made valuable additions to the library by the presentation of books, magazines, and pictures, and further gifts are earnestly desired.

Through the courtesy of the publishers many of our State papers are regularly found on the tables of the Reading Room.

ATHLETICS

Football, baseball, basketball, track athletics, and tennis are recognized as collegiate sports.

The general supervision of all athletic sports is vested in an athletic council composed of two members of the Faculty, two members of the Alumni Association, and three undergraduates, chosen from the three upper classes.

All eligibility rules originate with the Faculty.

Any student who is admitted to college later than the second Monday of a term is not eligible during that term to represent the college in outside athletic contests.

No student is permitted to represent the college on any athletic team or as manager of such, who is not in good standing in his class and doing, at the time, satisfactory work in his studies.

No student pursuing a course other than one leading to a degree will be permitted to represent the college in any athletic contest during his first year in residence, unless he shall have satisfied the entrance requirements of a course leading to a degree.

Buildings and Grounds

A spacious gymnasium containing apparatus for gymnastic exercises, a running track, shower baths, and a swimming pool, affords ample accommodations for indoor athletic sports, such as basketball, indoor-running, swimming contests, wrestling, and boxing.

In Frazer Field, the college possesses one of the best athletic fields in the country. This field, completely equipped, was donated to the college by Mr. and Mrs. Eben B. Frazer of Newark, and Mr. Stanley Frazer, '04, of New York City, as a memorial to a son and brother, Joseph Heckart Frazer, '03. The field contains a baseball diamond, football gridiron, tennis courts, and a quarter-mile cinder

track with a 220-yard straightaway. It is enclosed with a hollow tile stucco wall and has a beautiful terrace along one side.

State Bacteriological and Pathological Laboratory. By Act of the Delaware Legislature, a State Bacteriological and Pathological Laboratory has been established at the college. The Laboratory is under the management of the State Board of Health. Its location makes accessible the resources of the college in the way of libraries and apparatus.

ORGANIZATIONS

The Agricultural Club. The Agricultural Club is composed of the agricultural students and some members of the Faculty. It is under the management of the students, who elect their officers each term. Meetings are held weekly and subjects relating to both class work and actual farm practice are discussed. Lecturers of repute address the club on agricultural subjects. The object of the club is to create enthusiasm and to promote the interests of agriculture among the students as well as to accustom the members to talk on agricultural subjects before an audience.

Athletic Association. The Athletic Association is a student organization which takes charge of details of athletic affairs not controlled directly by the Athletic Council.

Athletic Council. The Athletic Council is in direct charge of all athletic activities not constituting a part of the college curriculum. It is composed of two representatives from the Faculty, two representatives from the Alumni, and three representatives from the Students, representing respectively the Senior, Junior, and Sophomore classes.

Chess Club. The Delaware College Chess Club meets regularly on Friday afternoons in its room in Old College. The Club maintains a team for intercollegiate matches and within its own membership conducts a number of tournaments through the college year. Two members of the College Faculty act as advisers and coaches for the Club and team.

Varsity Club. The Varsity Club is an organization composed of students who have earned their Varsity D. The purpose of the club is to create and maintain a better feeling among the letter men and to offer in its membership an additional reward to the mere earning of the letter.

Derelicts. The Derelicts is an honorary senior fraternity, the purpose of which is to create a spirit of good-fellowship throughout the Senior Class and the Student Body. The members of the Junior Class who are elected as members are informed of their election on the day of the Annual Inter-scholastic Track and Field Meet on Joe Frazer Field.

Wolf Chemical Club. The Wolf Chemical Club is an organization composed of undergraduate chemistry students of the college. The purpose of the club is to interest the students in the science of chemistry and to furnish a medium thru which they may come into closer contact with members of the Faculty and outside professional men.

Faculty Club. A Faculty Club was organized in 1918 for the purpose of promoting social intercourse among the members of the Faculty.

Footlights Club. The purpose of this organization is to present serious plays, comedies, and farces, in Newark or out of town as conditions may determine. No previous experience in dramatic work is required for admission to membership. Any student in Delaware College is eligible to apply for active membership, and any alumnus or member of the faculty may apply for honorary membership.

Fraternities. Three national Greek letter fraternities have local chapters at the college: Kappa Alpha (Southern), Sigma Nu, and Sigma Phi Epsilon. A fourth organization, Omega Alpha, is local. Three of these fraternities own their houses. The average resident membership is about sixteen.

Phi Kappa Phi. A Chapter of the Phi Kappa Phi, an honorary fraternity devoted to the interests of Scholarship, was established at the college in 1905.

Young Men's Christian Association. The college Y. M. C. A. is under the management of the students, who annually elect their officers and various committees. The object of the association is to promote Christian fellowship among the students and to furnish to all an opportunity for practical Christian work.

PUBLICATIONS

The regular publications of the college consist of the Delaware College Review, the Delaware Farmer, the Bulletin, and the Experiment Station Bulletin. The Review and the Delaware Farmer are student publications.

The Review. The Review is a weekly publication devoted to the general interest of the students. The subsubscription price is $1.50 a year.

The Delaware Farmer. The Delaware Farmer is published monthly during the college year by the Agricultural Club of Delaware College. The purpose of The Delaware Farmer is two fold: (1) to publish unbiased scientific facts applicable to farm practices on the Delmarvia Peninsula; (2) to aid in placing the work of Delaware College before as many people as possible. The subscription price is fifty cents per year.

The **Bulletin** is issued quarterly. One of the four numbers is the Catalogue number. The **Experiment Station Bulletin** is issued quarterly by the Experiment Station. One of the numbers is the Annual Report. These bulletins will be sent to any address.

Students' Loan Fund. A Loan Fund to help needy students was established by the Alumni Association in 1915. The object of the Committee, which was appointed by the President of the Association, is to raise a substantial sum of money which will be placed in trust and the income of which will be used to help deserving students. Definite amounts will be loaned to students on promissory notes which the student is expected to meet as soon as he is financially able.

ALUMNI ORGANIZATIONS AND ACTIVITIES

The Alumni Association of Delaware College is the central organization for the general body of Alumni. Membership is limited to graduates, and to former students who may be elected by the Association.

The Annual Business Meeting is held on the Saturday preceding Commencement Day each year. In the evening various reunions and celebrations are held. A midwinter dinner is held every year at the College on the Saturday nearest to Washington's Birthday.

A silver cup is offered by the Association to be competed for in an annual debate between teams representing the Sophomore and Freshman classes. This cup will become the property of the class which wins two debates. Medals for winners of events in the Inter-Class Track and Field Meet, and for athletes who break college records, are given by individuals among the Alumni.

The official organ of the Alumni Association is the Alumni News, a quarterly. The publication of this paper, which was suspended during the war, has just been resumed. The subscription price, which includes membership in the organization, is $2 per year. The Editor is George E. Dutton, '04, and the Business Manager, C. A. Short, '96.

Ways and Means Committee for 1918-1919: W. R. Edgar, '10, chairman; George McIntire, '96; Frank Collins, '83; George L. Medill; George E. Dutton, '04; C. A. Short, '96, and the officers of the Association ex officio.

The officers of the General Alumni Association for 1918-1919 are: President, J. Harvey Whiteman, '85; Vice-President, Francis A. Cooch, '93; Secretary and Treasurer, George E. Dutton, '04.

Graduates in various parts of the country have begun to organize branch alumni associations. Up to the present time, three active branches have been formed: The Western Pennsylvania Section, Pittsburgh, Pa.; the New England Society, Boston, Mass.; and the Philadelphia Society, Philadelphia, Pa.

DEGREES CONFERRED AT THE ANNUAL COMMENCEMENT

JUNE 10, 1918

Master of Science

Mark Lovel Nichols	Newark

Bachelor of Arts (Arts and Science Course)

Samuel Cannon	Wilmington
Donald Pancoast Horsey	Dover
Paul DeWitt Lovett	Newark
Frederick Colin McCaghey	Baltimore, Maryland
Leon Busick Stayton	Wilmington

Bachelor of Science (Arts and Science Course)

Harry Bratton Alexander	Elkton, Maryland
Gassaway Bond Brown	Newark
Rowland Delaware Herdman	Newark
Frank Saylor	Wilmington

Bachelor of Science in Agriculture

David Leonard Crockett	New York, New York
Jonathan Farr Davis	Meshoppen, Pennsylvania
Robert Perkins Goldey	Wilmington
William Hamilton Hann	Raven Rock, New Jersey
Elwood Hoffecker	Newark
Clyde Simpson Holland	Smyrna
Paul Gilbert Swayne	Wilmington
Nathaniel Watkins Taylor	Dover

Bachelor of Science in Civil Engineering

Knowles Ritchie Bowen	Newark
Henry Paul Cleaver	Marshallton
Allen Louis Lauritsen	Lewes
Robert Llewellyn Sumwalt	Lewes
Dewitt Clinton Davis Todd	Wilmington
Ernest Staton Wilson	Wilmington

Bachelor of Science in Mechanical Engineering

John Avery Mather	Oswego, Kansas

William Terry Mitchell	Newark
David Thompson Swing	Ridgely, Maryland

Bachelor of Science in Electrical Engineering

John William Alexander	Elkton, Maryland
William Dail Cannon	Bridgeville
Elmer Paul Catts	Clayton
William Bigelow Hoey	Frederica

Bachelor of Science in Chemical Engineering

Thomas Smyth Carswell	Wilmington
Ernest Melson Marks	Wilmington

PRIZES, SCHOLARSHIPS, AND HONORS ANNOUNCED AT THE COMMENCEMENT OF 1918

The Bishop Coleman Memorial Prize: Thomas Smyth Carswell

The Alumni Prizes: First, William Templin Broughall; second, Charlesworth Carswell

The Lieutenant Clarke Churchman Memorial Prize: Donald Pancoast Horsey

The Philo Sherman Bennett Prize: Alexander Blair, Jr.

The William D. Clark Prize for Mathematics: Charlesworth Carswell

The State Grange Prizes: First, Fred Boorman Martenis; second, Francis Leonard O'Rourke; third, Joseph Harrison Fairbanks

The Edward Reynolds Memorial Prizes in Chemistry: First, Thomas Smyth Carswell; second, Irviene Reed McElwee; third, Eugene Harlan Kennedy, Ralph Pickering Kennedy

Two du Pont Scholarships in Chemistry were awarded to Irviene Reed McElwee and Jay Robinson

The Robert Bayne Wheeler Scholarship for 1918-19 was awarded to Charles Whitney Woodrow

The following members of the Class of 1918 were elected to the Honorary Fraternity of Phi Kappa Phi:

Gassaway Bond Brown
Thomas Smyth Carswell
Henry Paul Cleaver
Jonathan Farr Davis
Donald Pancoast Horsey
Paul DeWitt Lovett
Ernest Melson Marks
Robert Llewellyn Sumwalt

STUDENTS IN ATTENDANCE DURING THE COLLEGIATE YEAR 1918-1919

Abbreviations: A. & S., Arts and Science; A., Agriculture; C. E., Civil Engineering; M. E., Mechanical Engineering; E. E., Electrical Engineering; Ch. E., Chemical Engineering; E., Engineering not specified.

SENIOR CLASS

Barnard, Daniel Paddock, 4th	Ch. E.	Wilmington
Cannon, Edward Selman	A. & S.	Wilmington
Cantwell, Garrett Reed	Ch. E.	Elsmere
Craig, John Gilbert	A. & S.	Wilmington
Crothers, John Lawson	A.	Mt. Pleasant
Dickey, Richard Earle	A.	Stanton
Downing, Hugh Wagner	E. E.	Philadelphia. Pa.
Ewing, Earle Elisha	A. & S.	Wilmington
Gum, John Poole	A. & S.	Frankford
Hearne, George Wilson	A. & S.	Washington. D. C.
Henvis, Edmund Wollaston	A. & S.	Wilmington
Humphrey, James Willard	Ch. E.	Claymont
Lang, George Millard	E. E.	Wilmington
Levey, William Scott	Ch. E.	Wilmington
Longland, George Madara	A.	Mt. Pleasant
Mackie, John Alfred	A. & S.	Kemblesville. Pa.
Marston, Henry White	A.	Wilmington
Martenis, Fred Boorman	A.	Wilmington
Maxwell, Joseph Pierson	E. E.	Wilmington
McElwee, Irviene Reed	Ch. E.	Wilmington
McKinney, William	E. E.	Wilmington
McMillan, James Gordon	A. & S.	Wilmington
Meredith, John Hazel	A.	Goldsboro. Md.
Mitchell, Henry Burton, Jr.	A. & S.	Millsboro
Mitchell, Morris Randolph	A. & S.	Newark
Moore, Willard Springer	E. E.	Wilmington
O'Rourke, Francis Leonard	A.	Newark
Penuel, Firman Clarence	A.	Georgetown
Plam, Louis Robert	A. & S.	Brooklyn, N. Y.
Robinson, Jay	Ch. E.	Wilmington

Smart, Lawrence Landon	M. E.	Baltimore, Md.
Sturgis, Russell Davis	A.	Wilmington
Sutfin, Charles Ide	A. & S.	Wilmington
Thomas, Alfred Bailey	A.	Philadelphia, Pa.
Walton, Albert Slack	E. E.	Newark
Wilson, Marvel	A.	Milford
Wise, William Arthur	A. & S.	Wilmington

JUNIOR CLASS

Anderson, John White, 3d	E. E.	Wilmington
Arbuckle, Paul Taylor, Jr.	Ch. E.	Cherry Hill, Md.
Barnard, William Ellison	A. & S.	Camden
Blair, Alexander, Jr.	A. & S.	Wilmington
Carswell, Charlesworth	C. E.	Wilmington
Carter, Francis Bayard	A. & S.	Newark
Colpitts, Robert Adrian	M. E.	Mt. Pleasant
Cullen, George Steele	A.	Elkview, Pa.
Edwards, Charles Grubb	A. & S.	Wilmington
Ely, George Amos	A.	Winterthur
Fell, Harvey Lewis	A.	Wilmington
Gordy, Leon Hackett	M. E.	Wilmington
Graves, Reed	M. E.	Marietta, Pa.
Grier, Harold Caulk	A. & S.	Milford
Hudson, George Henry, Jr.	C. E.	Wilmington
Jefferis, Joseph Irwin	A.	Stanton
Kennedy, Eugene Harlan	Ch. E.	Newark
Kennedy, Ralph Pickering	Ch. E.	Marshallton
Kite, Robert Paul	Ch. E.	Wilmington
Lattomus, Winfield Wilson	C. E.	Townsend
Lindell, William Francis	E. E.	Newark
Loose, Harry Walter	M. E.	Wilmintgon
Marshall, Robert Twilley	M. E.	Chincoteague. Va.
Marvel, Phillip Henry	E. E.	Houston
McCardell, Frank Paul	A.	Wilmington
McWhorter, John Francis, Jr.	Ch. E.	Middletown
Nelson, George Merle	E. E.	Delmar
O'Neill, John Francis	Ch. E.	Wilmington
Pool, Frank Robinson, Jr.	A.	McDonough
Ritz, Walter Raymond	A. & S.	Newark
Russo, Julio	E. E.	Wilmington
Shaw, Merville Charles	E. E.	Wilmington
Smith, Draper	A. & S.	Wilmington
Terrell, Hasson Taylor	Ch. E.	Elkton, Md.
Thomas, Norman	M. E.	Canterbury
Tunnell, Charles	A.	Georgetown
Whiteman, Thomas Moore	A.	Delaware City
Yacobyan. Leon	M. E.	Wilmington

SOPHOMORE CLASS

Aikens, George Holton	A. & S.	Wilmington
Alexander, Howard Berton	A.	Oil City, Pa.
Anderson, William Thomas	E. E.	Henry Clay
Attix, Charles Thomas	C. E.	Kenton
Bacon, Lewis Heisler Ball	A. & S.	Bacon
Barnard, John Arnold, Jr.	A.	Wyoming
Boulden, Marion Packard	C. E.	Elkton. Md.
Bradley. Henry George	A. & S.	Wilmington
Broughall, William Templin	A. & S.	Wilmington
Brown, Harvey Newton	A. & S.	Newark
Casey, John Andrew	A. & S.	Wilmington
Chandler, Albert Norris	M. E.	Wilmington
Chovenson, Samuel Harry	E. E.	Wilmington
Cooch, Francis Allyn, Jr.	A.	Newark
Craig, James Draper	Ch. E.	New Castle
Denney, Courtland Forrest	Ch. E.	Wilmington
Dole, Thomas Hyde	A. & S.	Wilmington
Donoho, William Claggett Dorsey	A. & S.	Seaford
Elzey, Welton Franklin	A.	Seaford
Evans, Clarence William	A. & S.	Newark
Fairbanks. Joseph Harrison	A.	Wilmington
Frederick, William Heisler	C. E.	Marshallton
Gass, Charles Wardon	E. E.	Marshallton
German, George Burton	A. & S.	Delmar
Goggin, Henry Reed	A.	El Paso, Tex.
Handy, Roland Cookman	A.	Federalsburg, Md.
Harris, Howard Monroe	A.	Preston. Md.
Harris, Louis Barrett	A. & S.	Wilmington
Hemphill, William Albert	C. E.	Delaware City
Holland, Thomas Wilmer	Ch. E.	Smyrna
Horty, James Albert	C. E.	Wilmington
Johnson, Allen Jaquith	M. E.	Middletown
Jones, Harry Herman	A.	Woodside
Keesey, Russell Kirk	E. E.	Perryville, Md.
Killen, William Meredith	A.	Felton
Kleine, Theodore John	A.	Philadelphia, Pa.
Kohlerman, James Harold	Ch. E.	Wilmington
Levandis, John Alexander	A. & S.	Wilmington
Lindsay, Walter David	E. E.	Providence, Md.
Lord, Fred Clark	A. & S.	Dover
Lynch, Charles Stewart	A. & S.	Wilmington
Madden, George Harney	A. & S.	New Castle
McCaughan, Hugh, Jr.	Ch. E.	Wilmington
McCorkindale, William James, Jr.	A.	Wilmington
McMullen, Joshua Willard	A. & S.	Lincoln City, Pa.
McMullen, Richard Huchinson	E. E.	Wilmington
Monaghan, Paul Kane	A. & S.	Wilmington
Morris, John James	A. & S.	Milton

Mulrooney, Thomas William	Ch. E.	Wilmington
Olcott, John Woodward	A.	Washington. D. C.
Peach, William Paul, Jr.	A.	Newark
Phillips, Claude Ellis	A.	Delmar
Pierson, John Crumbaugh	A. & S.	Wilmington
Pool, Jefferson Foard	A.	McDonough
Preston, Ira Lucas	C. E.	Trenton, N. J.
Price, George Cleaver	M. E.	Newark
Price, John Fletcher	Ch. E.	Carney's Point, N. J.
Raughley, George Wilson	A.	Dover
Sipple, George Massey	C. E.	Milford
Smyth, William John	C. E.	Wilmington
Spaid, Arthur Farquhar	A. & S.	Dover
Steele, Ira Kenneth	M. E.	Newark
Tonkin, Enoch George	C. E.	Wilmington
Waples, George Franklin	M. E.	Milton
Wilson, Joseph Samuel	A.	Georgetown
Wise, Joseph Coley	M. E.	Smyrna
Wood, Melvin Frederick	C. E.	Wanaque, N. J.
Work, John Fulton	A. & S.	Elkton, Md.

FRESHMAN CLASS

Alexander, Thomas Clement	A.	Claymont
Allen, Alvan	Ch. E.	Wilmington
Allmond, David Robinson, Jr.	C. E.	Wilmington
Ayerst, Albert Douglas	Ch. E.	Elkton, Md.
Baumgardt, William Christian	A. & S.	Richardson Park
Brooks, Abe	C. E.	Philadelphia, Pa.
Brown, John Wilmot	C. E.	Dover
Bunten, William Henry	M. E.	Philadelphia, Pa.
Burbage, Arthur Vernon	Ch. E.	Berlin, Md.
Carll, Robert Heath	A.	Camden, N. J.
Carter, George Gray	Ch. E.	Newark
Carter, Maynard Harper	Ch. E.	Wilmington
Challenger, Barclay Roberts	M. E.	Claymont
Chambers, Gilbert Dickey	A. & S.	Newark
Chavin, Simon	E.	Wilmington
Christfield, John Gilbert	M. E.	Wilmington
Dantz, Theodore Roosevelt	Ch. E.	Woodbury, N. J
De Luca, John James	A. & S.	Wilmington
Dixon, Eric Stanton	A. & S.	Salem, N. J.
Downes, John Schoch	A. & S.	Dover
Draper, Milton Lowber	Ch. E.	Wyoming
Fisher, Lindale Carson	A. & S.	Wyoming
Fletcher, Robert Paulson, Jr.	E. E.	Wilmington
Foulk, Robert North	A. & S.	Wilmington
Gela, William	A. & S.	Philadelphia, Pa.
Geoghegan, Henry	Ch. E.	Newark, Md.
Goffigon, Oliver Winfield	M. E.	Marionville, Va.

Hallett, William Emerson	E. E.	Milford
Harper, Joseph Howard	A.	Still Pond, Md.
Hayes, John James, Jr.	C. E.	Wilmington
Hollett, Joseph Lawrence	Ch. E.	New Castle
Hopkins, Melvin	A. & S.	Dover
Hunt, Thomas Edgar	A. & S.	Wilmington
Hurff, Leland	A.	Elmer, N. J.
Iliffe, Edgar William	C. E.	Millsboro
Jackson, Charles Wilson, Jr.	E. E.	Ridgely, Md.
Jacobs, Wm. Franklin Pierce, Jr.	E. E.	Smyrna
Jones, Wilmer Dewey	A. & S.	Wilmington
Kavanagh, Joseph Charles	E. E.	Wilmington
Keith, Thomas Muncy	A. & S.	Dover
Layton, Asbury Burke	A. & S.	Richardson Park
Lemmon, Norman Edward	Ch. E.	Wilmington
Lynch, Howard Eldridge, Jr.	C. E.	Dover
Magee, Arley Benjamin, Jr.	A. & S.	Dover
Maroney, Samuel Patterson	Ch. E.	Wilmington
Meyers, Joseph Shelly	A. & S.	Middletown
Mowlds, William Lyle	A.	Bellevue
Newton, Walter Ira	M. E.	Wilmington
Reed, Albert Chrisman	M. E.	Washington, D. C.
Reynolds, Clayton	A.	Port Deposit, Md.
Richards, Vernon William	A.	Wardtown, Va.
Roemer, Louis Edward	Ch. E.	Wilmington
Rothrock, Joseph John	A. & S.	New Castle
Rovner, Joseph Robert	C. E.	Brooklyn, N. Y.
Russo, Joseph Romeo	A. & S.	Wilmington
Shane, Herman Edward	A. & S.	Georgetown
Singley, John	A.	Philadelphia, Pa.
Smith, Gerald Camille	C. E.	Wilmington
Stewart, Robert	A. & S.	Wilmington
Triggs, Willard Robinson	M. E.	Wilmington
Ward, Paul Revere	C. E.	Wilmington
Wills, Franklin Knight	C. E.	Wilmington
Wilson, John Edwin, Jr.	E.	Smyrna
Woloschuk, Nicholas John	A. & S.	Shenandoah, Pa.
Wood, Joseph Chandler	Ch. E.	Wilmington
Woodrow, Charles Whitney	Ch. E.	Wilmington
Zimmerman, Harry Franklin	Ch. E.	Wilmington

SUMMARY

	Arts and Science	*Agriculture*	*Engineering*	*Total*
Seniors	13	11	13	37
Juniors	7	8	23	38
Sophomores	20	18	30	68
Freshmen	20	8	39	67
	60	45	105	210

GENERAL SUMMARY

Delaware College	210
Women's College of Delaware	87
Summer School 1918	189
Grand Total	486

THE STUDENTS ARMY TRAINING CORPS

In the fall of 1918 the college underwent reorganization as a unit of the Students Army Training Corps. The colleges were threatened with disruption by the Man Power Act of August, 1918, which lowered the draft age to 18; and the Students Army Training Corps was designed to utilize their equipment and organization for the training of officers and noncommissioned officers. The students were regularly inducted into the United States Army. They followed uniform courses of military and academic instruction prescribed by the Committee on Education and Special Training, and the college was operated as a military post. The unit consisted of 215 enlisted men, and 16 enrolled students, not of age for enlistment. Six others not qualified for service attended the college as civilians.

Academic instruction was carried on by the regular faculty. The college as a military post was under the command of Captain Victor N. Camp, U. S. A., assisted by six infantry officers, a quartermaster, and a medical officer. Drill and discipline were in charge of 1st. Lieut. Robert W. Glenn, Infantry, who had served with the A. E. F. in the Vosges sector between April and July. The medical officer was 1st. Lieut. Milton Aronowitz, M. C., to whom was due the escape of the college from the worst consequences of the influenza epidemic. The personnel officer was 2d. Lieut. Kent Roberts Greenfield, Infantry, a member of the faculty on leave of absence, and a graduate of the Plattsburg S. A. T. C. Camp.

The unit was demobilized December 13. It was ranked by District Headquarters as one of the five most efficient units of the fifty-five in the Third District.

On July 1, 1918, the College plant was placed at the disposal of the War Department to be used in training

mechanics for the army. Courses in Gas Engines, Electricity, Radio, Machine Shopwork, and Bench Wood Work were given by the engineering faculty, with special assistance. Two hundred men were inducted July 1; a second detachment, on September 1. After the opening of the 1918-19 session, the mechanics formed Section B of the S. A. T. C. Unit. In all about 400 men were graduated, and assigned to various army units for technical service. The third detachment, which would have entered November 1, was held up on account of the impending armistice, but the organization was kept intact until demobilization in December.

S. A. T. C. ENROLLMENT

Aikens, G. H.
Alexander, T. C.
Allen, A.
Anderson, J. W., 3rd
Arbuckle, P. T., Jr.
Armor, J. P.
Attix, C. T.
Ayerst, A. D.
Bacon, L. H. B.
Barkley, R. J.
Barnard, D. P., 4th
Barnard, J. A.
Bartow, W. W.
Baumgardt, W. C.
Baynum, G. R.
Beach, J. W.
Boulden, M. P.
Bouzarth, C. O.
Bradley, H. G.
Brewer, W. C.
Brittingham, W. H.
Brooks, A. L.
Brown, H. N.
Brown, J. W.
Bunten, W. H.
Burns, G. F.
Cannon, E. S.
Cantwell, G. R.
Carll, R. H.
Carswell, C.
Chaires, E. L.
Challenger, B. R.
Chambers, G. D.
Chambers, S.
Chandler, A. N.
Christfield, J. G.
Cobb, L. L.
Colpitts, R. A.
Conaway, C. H.
Cooch, F. A., Jr.
Craig, J. G.
Crossan, M. G.
Crothers, J. L.
Crothers, R. R.
Cubbage, M. F.
Dane, B. B.
Dantz, T. R.
Davis, L. W.
DeLuca, J. J.
Denison, H. W.
Dickey, R. E.
Diffendall, F. E.
Dixon, E. S.
Donoho, W. C. D.
Downes, J. S.
Downey, S. A.
Downing, E. E.
Downing, H. W.
Draper, M. L.
Eaton, R. B.
Edwards, C. G.
Ely, G. A.
Elzey, W. F.
England, C. W.
Evans, C. W.
Evans, N. H.
Fairbanks, J. H.
Fell, H. L.
Fields, C. M.
Fisher. L. C.
Fletcher. R. P., Jr.
Foulk, R. N.
Frederick, W. H.
Gass, C. W.
Gela, W.
Geoghegan, H. B.
German, G. B.
Goffigon, O. W.
Goodman, H. C.
Gordy, L. H.
Gorry, J. F.
Graves, R.
Hancock, J. R.
Handy, R. C.
Haney, G. M.
Harris, H. M.
Hatfield, H. D.
Hays, J. J.
Hearne, G. W.
Hemphill, W. A.
Hoch, P. K.
Hodgson, F. A.
Hoey, E. A.

Holland, T. W.
Hollett, J. L.
Hoopes, O. C.
Hopkins, M.
Horty, J. A.
Humphrey, J. W.
Hunt, T. E.
Hurff, L.
Hutcheson, P. A., Jr.
Iliffe, E. M.
Jacobs, W. F. P., Jr.
Jester, O. J.
Johnson, A .J.
Jones, A. H.
Jones, W. D.
Kavanagh, J. C.
Keesey, R. K.
Keith, T. M.
Kennedy, E. H.
Kennedy, R. P.
Killen, W. M.
Kite, R. P.
Klund, W. F.
Kohlerman, J. H.
Lancaster, V. C.
Lang, G. M.
Lattomus, W. W.
Layton, A. B.
Lemmon, N. E.
Levey, W. S.
Lindell, W. F.
Lindsay, W. D.
Long, R. W.
Longland, G. M.
Loose, H. W.
Lord, F. C.
Lynch, C. S.
Lynch, J. M.
Magee, A. B.
Maroney, S. P.
Martenis, F. B.
Martin, L. V.
Marvel, P. H.
Maxwell, J. P.
McAllen, R. W.
McCaughan, H., J.r
McElwee, I. R.
McKinney, W.
McMaster, W. L.
McMullen, R. H.
McWhorter, J. F.
Meyers, J. S.
Middleton, J. R.
Miller, W. C.
Moore. R. C.
Moore. W. S.
Mowlds, W. L.
Mulrooney, T. W.
Musselman, G. T.
Nelson, G. M.
Newton, W. I.
Nordquist, D. E.
O'Neill, J. F.
O'Rourke, F. L.
Parker, C. H.
Phillips, C. E.
Pierson, J. C.
Plam, L. R.
Pool, F. R.
Pool, J. F.
Price, J. F.
Quillin, H. E.
Reed, R. H., Jr.
Reynolds, C.
Reynolds, W. B.
Richards, V. W.
Ritz, W. R.
Rothrock, J. J.
Rovner, J. R.
Ruos, G. V.
Russo, J.
Russo, J. R.
Samuelson, F. F.
Schlesinger, E. G.
Seibert, P. M.
Seybold, W. H.
Shane, H. E.
Simpers, R. C.
Singley, J.
Sipple, G. M.
Sirman, E. T.
Smith, G. C.
Smyth, W. J.
Spaid, A. F.
Sparks, L., Jr.
Steele, I. K.
Stewart, R.
Sturgis, R. D.
Tatnall, H. R.
Tatnall, T., Jr.
Terrell, H. T.
Thomas, N.
Tonkin, E. G.
Triggs, W. R.
Van Burkalow, C. S.
Vita, A. J.
Wagamon, B. L.
Walton, A. S.
Waples, G. F.
Ward, P. R.
White, D. C.
Wills, F. K.
Wilson, J. S.
Wilson, M.
Wise, J. C.
Wise, W. A.
Woloschuk, N. J.
Wood. J. C.
Wood, M. F.
Work, J. F.
Yacobyan, L.
Zimmerman, H. F.

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DELAWARE COLLEGE BULLETIN

VOLUME XV NEW SERIES NUMBER 3

MARCH, 1920

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ANNUAL CATALOGUE
1919-1920

PUBLISHED QUARTERLY BY THE COLLEGE
NEWARK, DELAWARE

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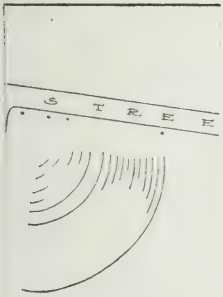

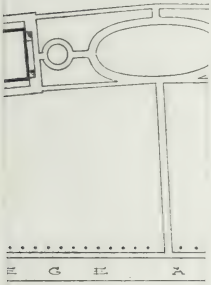

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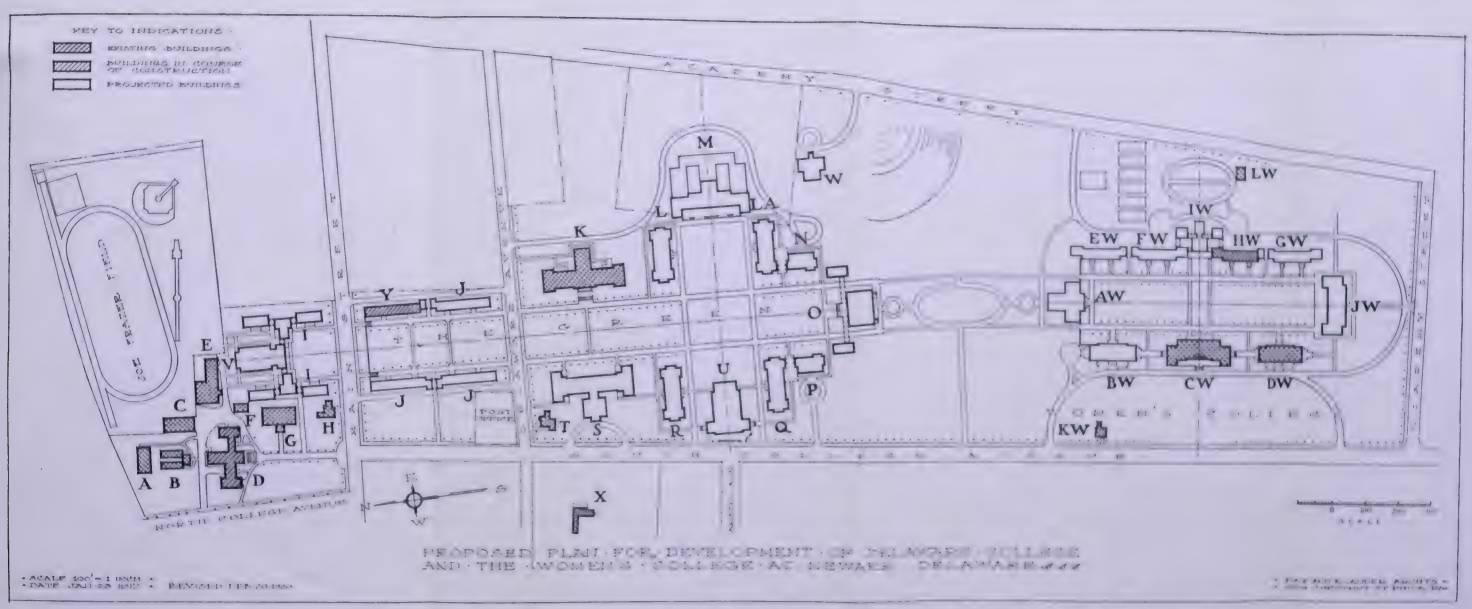

PROPOSED GROUP PLAN FOR THE DEVELOPMENT OF DELAWARE COLLEGE AND THE WOMEN'S COLLEGE OF DELAWARE

DELAWARE COLLEGE

A.	Old Heating Plant.	J-J-J-.	Dormitories.	R.	Social Science.
B.	Greenhouses,	K.	Wolf Hall—Agriculture.	S.	Liberal Arts
C.	Gymnasium.	L.	Physics.	T.	Infirmary.
D.	Old College.	LA.	Recitation Building.	U.	Auditorium.
E.	Mechanical Hall.	M.	Engineering Building.	V.	Proposed Gymnasium.
F.	Board of Health Laboratory.	N.	Unassigned.	W.	New Power Plant.
G.	Recitation Hall.	O.	Library.	X.	President's Home.
H.	Purnell House.	P.	Administration Building.	Y.	Harter Hall.
I-I.	Fraternity House Group.	Q.	English.		

WOMEN'S COLLEGE

A-W.	Y. W. C. A.	H-W.	Sussex Hall.
B-W.	College Hall.	I-W.	Common and Social Hall.
C-W.	Science Hall.	J-W.	Unassigned.
D-W.	Residence Hall	K-W.	Practice Home.
E-W, F-W, G-W	Dormitories.	L-W.	Old Heating Plant.

CATALOGUE

OF

DELAWARE COLLEGE

1919-1920

WITH

ANNOUNCEMENTS FOR 1920-1921

PUBLISHED BY THE COLLEGE

NEWARK, DELAWARE

1920

JANUARY

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DECEMBER

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CALENDAR

1920		
January 5	Monday	Christmas recess ends, 1.00 p. m.
January 22-31		Mid-Year Examinations
February 2	Monday	Second term begins, 8.00 a. m.
February 21	Saturday	Meeting of the Trustees, 10.30 a. m.
April 1	Thursday	Easter recess begins, 4.00 p. m.
April 6	Tuesday	Easter recess ends, 8.00 a. m.
June 7-11		Final Examinations
June 12	Saturday	Meeting of the Trustees, 10.30 a. m. Class Day—Alumni Day—Farmers' Day
June 13	Sunday	Community Meeting, 11.00 a. m. Baccalaureate Sermon, 8.00 p. m.
June 14	Monday	Commencement Day
June 16, 17		Examinations for Admission

SUMMER VACATION

June 28	Monday	Summer School for Teachers opens.
August 6	Friday	Summer School for Teachers closes.
September 14, 15		Examinations for Admission
September 16	Thursday	First term begins, 8.00 a. m.
November 23	Tuesday	Meeting of the Trustees, 10.30 a. m.
November 24	Wednesday	Thanksgiving recess begins, 4.00 p. m.
November 29	Monday	Thanksgiving recess ends, 1.00 p. m.
December 23	Thursday	Christmas recess begins, 11.50 a. m.
1921		
January 3	Monday	Christmas recess ends, 1.00 p. m.
January 20-29		Mid-Year Examinations
January 31		Second term begins, 8.00 a. m.
February 19	Saturday	Meeting of the Trustees, 10.30 a. m.
March 24	Thursday	Easter recess begins, 4.00 p. m.
March 29	Tuesday	Easter recess ends, 8.00 a. m.
June 6-10		Final Examinations
June 11	Saturday	Meeting of the Trustees, 10.30 a. m. Class Day—Alumni Day—Farmers' Day
June 12	Sunday	Community Meeting, 11.00 a. m. Baccalaureate Sermon, 8 p. m.
June 13	Monday	Commencement Day
June 15, 16		Examinations for Admission

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TRUSTEES OF DELAWARE COLLEGE

Ex Officio

The Governor, John G. Townsend, Jr., Selbyville
The President of the State Board of Education, George B. Miller, Wilmington
The Master of the State Grange, Jacob H. Rosa, Milford
The President of the College, Samuel Chiles Mitchell

H. G. M. Kollock, M. D., Newark..... 1882
J. Harvey Whiteman, Esq., Wilmington..... 1892
Charles B. Evans, Esq., Newark..... 1894
William T. Lynam, Esq., Wilmington..... 1897
Charles S. Conwell, Camden..... 1897
Daniel W. Corbit, Odessa..... 1899
L. Heisler Ball, M. D., Marshallton..... 1900
W. Watson Harrington, Esq., Dover..... 1900
Samuel H. Messick, Bridgeville..... 1902
James E. Dutton, Seaford..... 1904
John Biggs, Esq., Wilmington..... 1905
Samuel H. Derby, Woodside..... 1905
Joseph H. Hossinger, Newark..... 1908
Thomas Davis, Esq., Wilmington..... 1908
Samuel J. Wright, Newark..... 1910
Edward D. Hearne, Esq., Georgetown..... 1910
Henry Ridgely, Esq., Dover..... 1911
Charles M. Curtis, Esq., Wilmington..... 1911
Everett C. Johnson, Dover..... 1911
Henry B. Thompson, Greenville..... 1912
Eben B. Frazer, Newark*..... 1913
H. Rodney Sharp, Wilmington..... 1915
W. H. Heald, Esq., Wilmington..... 1915
Charles Barker, Milford..... 1916
Edward A. Evans, Cheswold..... 1916
Charles R. Miller, Wilmington..... 1917
H. F. DuPont, Winterthur..... 1918
Harry Cannon, Bridgeville..... 1918

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*The last eight members of the Board are gubernatorial appointments.

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Samuel H. Messick, *Vice President*
Charles B. Evans, *Secretary*

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Harry Cannon
H. F. duPont
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S. H. Derby, *Chairman*

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Charles M. Curtis, *Chairman*

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Thomas Davis

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GEORGE ABRAM HARTER, PH. D.
Professor of Mathematics and Physics

ELISHA CONOVER, A. M.
Professor of Ancient Languages and Literatures

EDWARD LAURENCE SMITH, A. M. — *Dean of the College*
Professor of Modern Languages and Literatures

MERRILL VAN GIESEN SMITH, M. E.
Professor of Mechanical Engineering

CLINTON OSBORNE HOUGHTON, A. B. — *Professor of Biology*

WILBUR OWEN SYPHERD, PH. D. — *Professor of English*

HARRY HAYWARD, S. M.* — *Dean of Agriculture*
Professor of Animal Husbandry

CLARENCE ALBERT SHORT, S. M.*
Professor of Mathematics and Engineering

CHARLES ANDREW MCCUE, S. B. — *Dean of Agriculture*
Professor of Horticulture

ARTHUR ELLIOTT GRANTHAM, A. B., S. B.* — *Professor of Agronomy*

CHARLES LYNDALL PENNY, A. M., SC. D. — *Professor of Chemistry*

EARNEST VANCOURT VAUGHN, PH. D.
Professor of History and Political Science

FIRMAN THOMPSON, S. B. — *Acting Dean of Engineering*
Professor of Chemistry

THOMAS FRANKLIN MANNS, PH. D.
Professor of Plant Pathology and Soil Bacteriology

ALLAN REGINALD CULLIMORE, S. B.* — *Dean of Engineering*
Professor of Civil Engineering

CHARLES CONGER PALMER, S. M., D. V. M.
Professor of Bacteriology and Hygiene

GEORGE ELLIOTT DUTTON, A. M. — *Professor of English*

WILLIAM ALBERT WILKINSON, A. M.
Professor of Psychology and Education

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* Resigned, February, 1920.

HOMER HOYT, J. D. *Professor of Business Administration*

ROY KEGERREIS, M. E. in E. E. *Professor of Electrical Engineering*

CARLETON COULTER, JR., Captain of Infantry, U. S. A.
Professor of Military Science and Tactics

RAYMOND WALTER HEIM, S. M.
Professor of Vocational Agricultural Education

CARLETON FRIEND MILLER, PH. D. *Professor of Chemistry*

GUY ERWIN HANCOCK, S. M., E. E. *Professor of Physics*

HOWARD KENT PRESTON, C. E.
Professor of Mathematics and Engineering

ROBERT W. THOROUGHGOOD, C. E. *Professor of Civil Engineering*

HAROLD NEFF CUMMINGS, A. B., S. B.
Associate Professor of Civil Engineering and Mathematics

CHARLES WILBUR BANKS, C. E.*
Associate Professor of Mechanical and Electrical Engineering

JOHN MARVIN LECATO, A. M.
Associate Professor of Plant Pathology

KENT ROBERTS GREENFIELD, PH. D.
Associate Professor of History and Economics

THOMAS ALEXANDER BAKER, S. B.
Associate Professor of Animal Husbandry

JOHN ROBERT MOORE, PH. D. *Assistant Professor of English*

REINHOLD EUGEN SALESKI, A. M.
Assistant Professor of Modern Languages

FINLEY MELVILLE KENDALL FOSTER, PH. D.
Assistant Professor of English

HOWARD BURTON SHIPLEY *Director of Athletics*

RAY JEROME FRIANT, S. B. *Assistant Professor of Agronomy*

GEORGE ELDER BRINTON, PH. B.
Assistant Professor of Modern Languages

RAYMOND WATSON KIRKBRIDE, S. B.
Assistant Professor of Modern Languages

JOHN LINTON COYLE *Instructor in Shop Work*

LEO BLUMBERG, E. E. *Instructor in Engineering*

JOHN R. THOENE, E. E. *Instructor in Engineering*

FREDERICK A. THOENE, M. E. *Instructor in Mechanical Engineering*

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* Resigned, February, 1920.

STANDING COMMITTEES OF THE FACULTY

ADMISSION: Professor Dutton, *Chairman;* Professor Sypherd, Dean McCue.

ADVANCED DEGREES: Professor Vaughn, *Chairman;* Professor Sypherd, Acting Dean Thompson, Associate Professor LeCato, Associate Professor Cummings.

ADVANCED STANDING: Dean Smith, *Chairman;* Dean McCue, Acting Dean Thompson.

ATHLETICS: Faculty Representatives on the Athletic Council—Dean Smith, *President;* Professor Dutton, *Vice-President;* Director of Athletics Shipley, *Manager.*

CENTRAL: Arts and Science—Dean Smith, Professor Harter, Professor Sypherd. Agriculture—Dean McCue, Professor Manns, Associate Professor Baker. Engineering—Acting Dean Thompson, Professor Smith, Professor Thoroughgood. Military Department—Captain Coulter.

EXTENSION: Professor Vaughn, *Chairman;* M. O. Pence, T. T. Martin.

PRIZES AND SCHOLARSHIPS: Professor Sypherd, *Chairman;* Professor Conover, Professor Preston.

PUBLICITY: Professor Conover, *Chairman;* Professor Dutton, Assistant Professor Foster, Dean McCue, Acting Dean Thompson, Associate Professor Greenfield.

SCHEDULE: Assistant Professor Foster.

SCHOLARSHIP: Dean Smith, *Chairman;* Professor Vaughn, Professor Sypherd, Professor Smith, Professor Dutton, Dean McCue, Acting Dean Thompson, Professor Thoroughgood.

STUDENT ENTERTAINMENTS, ORGANIZATIONS, AND PUBLICATIONS: Professor Sypherd, *Chairman;* Dean McCue, Assistant Professor Foster.

STUDENTS' SCHEDULES: Arts and Science—Dean Smith, *Chairman;* Professor Conover, Professor Vaughn. Agriculture—Dean McCue, *Chairman;* Associate Professor Baker, Assistant Professor Friant. Engineering—Acting Dean Thompson, *Chairman;* Professor Smith. Professor Preston.

STUDENT SELF-HELP: Professor Hancock, *Chairman;* Professor Miller.

OTHER OFFICERS

Secretary of the Faculty, Dean E. L. Smith
Secretary to the President, Helen Steele
Secretary to the Dean of the College, Cornelia G. Pilling

Acting Librarian, Professor W. O. Sypherd
Assistant Librarian, May Kerr

Business Administrator, A. G. Wilkinson
Superintendent of Grounds and Buildings, D. Lee Rose
Director of the Commons, Emily B. Hall

EXPERIMENT STATION STAFF

C. A. McCue, S. B.	*Director and Horticulturist*
A. E. Grantham, S. B.*	*Agronomist*
Thomas F. Manns, Ph. D.	*Plant Pathologist*
E. M. R. Lamkey, Ph. D.	*Plant Physiologist*
T. A. Baker, S. B.	*Animal Husbandman*
H. T. King, S. B.*	*Chemist*
C. C. Palmer, S. M., D. V. M.	*Bacteriologist and Animal Hygienist*
N. L. Partridge, Ph. D.*	*Research Horticulturist*
J. M. LeCato, A. M.	*Associate Plant Pathologist*
G. V. C. Houghland	*Assistant Agronomist*
J. A. Skooglund, S. B.*	*Assistant Chemist*
S. C. Noble, S. B.	*Assistant Chemist*
Ruth Jefferson, A. B.	*Secretary*
Florence Colbert	*Librarian*

EXTENSION DEPARTMENT

C. A. McCue, S. B.	*Director and Specialist in Horticulture*
M. O. Pence, S. B.	*State Leader of County Agents*
Theodore T. Martin, A. B., S. B.	*Boys' and Girls' Club Leader*
J. M. Le Cato, A. M.	*Specialist in Plant Diseases*

COUNTY AGENTS

R. O. Bausman, S. B., *New Castle County*
A. D. Cobb, S. B., *Kent County*
M. C. Vaughn, S. B., *Sussex County*

HOME DEMONSTRATION AGENTS AND COUNTY CLUB LEADERS

Helen L. Comstock, S. B., *Kent County*
Agnes Medill, *New Castle County*
Dorothy Emerson, *Sussex County*

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*Resigned, February, 1920.

DELAWARE COLLEGE

DELAWARE COLLEGE is situated at Newark, a town of 2000 inhabitants, about half-way between Philadelphia and Baltimore on the main lines of the Pennsylvania and Baltimore and Ohio Railroads running from New York to Washington. The climate is equable; the surrounding country is attractive; and the town itself has all modern improvements, including an excellent supply of artesian well water and a complete sewerage system.

FOUNDATION

Delaware College was chartered as a private college in 1833 by an Act of the Delaware Legislature and was first opened to students in May, 1834. As a result of a succession of misfortunes the college was closed from 1859 to 1870. It was reopened in 1870, having meanwhile been designated by an Act of the Delaware Legislature as beneficiary under the Act of Congress known as the "Morrill Bill," which apportioned to each of the several states large areas of public lands to form the basis of endowments for colleges devoted especially to the teaching of Agriculture, the Mechanic Arts, and Military Tactics. The college was thus under combined private and State ownership until 1913, when it came into the sole possession of the State. It is now in the full sense of the word a State College. The Board of Trustees consists of 28 members, together with the Governor of the State, the President of the College, the Master of the State Grange, and the President of the State Board of Education, all of whom are members ex officio.

BUILDINGS AND GROUNDS

Extensive additions have recently been made to the grounds and buildings of the college. In May, 1915, a large

tract of land lying between Delaware College and The Women's College of Delaware was given to the college by an unnamed donor. On this land buildings are being erected as needed. Wolf Hall, which houses the Departments of Agriculture, Chemistry, Bacteriology, and Biology; Old College, which is used as a Commons and for various other purposes; and Harter Hall, the First Dormitory, which accommodates 59 students, were all completed in 1917.

Frazer Field, the gift of several members of the Frazer family, of Newark, affords excellent facilities for outdoor sports and games.

Connected with the college, and used for purposes of instruction and experimentation, is the State Farm, a farm of 217 acres.

The buildings of The Women's College of Delaware, affiliated with Delaware College, are located on a plot of nineteen acres, adjoining the campus of the college.

Financial Support

The college is supported by the State of Delaware, by Federal appropriations, and by contributions from Alumni and other friends of the college.

SCOPE OF WORK

The following Courses of Instruction are offered by Delaware College:

I **Arts and Science,** a four years' course, leading to the degree of Bachelor of Arts or Bachelor of Science. See pages 28 to 31.

II **Agriculture,** a four years' course, leading to the degree of Bachelor of Science. See pages 31 to 34.

III **Engineering**—Civil, Mechanical, Electrical, and Chemical—and Marine Transportation, four years' courses, leading to the degree of Bachelor of Science. See pages 34 to 41.

Tuition is free to all students from the State of Delaware. The college constitutes a part of our system of free public instruction. In its scheme of education, the culture of liberal learning and the practical usefulness of the applied sciences are equally emphasized.

Extension Work

Agriculture. The Agricultural Extension work of Delaware College is supported by a Federal appropriation known as the Smith-Lever fund, supplemented by State appropriations. The work is carried on largely by County Agents, one of whom is located in each county, by two women trained in home administration, who spend practically the whole of their time in the field, and by a "boys and girls' club" department. The function of these agents is to supply the people with the most helpful information, and to render any service possible in the development of the agricultural resources of the State.

The college co-operates with the field workers by supplying material and providing lectures, as well as by planning and assisting in inaugurating new projects.

Academic Extension Work. The purpose of this department is to provide classes of instruction and courses of lectures for those who are not regularly enrolled in Delaware College. Under proper conditions credit is given by Delaware College for work done in such classes. This year the department has conducted the following evening and afternoon classes in Wilmington: English Composition and Business Correspondence, Business Law, Economics and Methods in Geography. In addition a course of ten lectures on Modern Political and Social Problems has been conducted in Dover.

The department holds itself ready to establish either classes or lecture courses in any part of the State where there is sufficient demand to support the work financially.

General Lectures. The members of the Faculty of Delaware College and of the Women's College of Delaware

will, as far as their time permits, deliver lectures before the schools, women's clubs and other organizations throughout the State.

Summer School

Each year there is held at the College, under the direction of the Department of Education of Delaware College and the Women's College of Delaware, a Summer School of six weeks' duration. This is essentially a teachers' training school. The work offered includes courses in the common school branches, methods of teaching, and a limited number of advanced courses. Thus the needs of all classes of teachers are provided for, but special attention is given to the needs of rural and elementary teachers.

Tuition is free to Delaware teachers. Furthermore, the State, under certain conditions, pays the room, board, and transportation expenses of those who teach in Delaware during the ensuing year.

The session for 1920 will be held from June 28 to August 6, inclusive. Complete information concerning the session will be furnished by the Director of the Summer School.

The Experiment Station

The Delaware College Experiment Station, a research department of the college, was made possible by an Act of Congress passed in 1887, known as the Hatch Act. Under the provisions of this act each state received an annual appropriation of $15,000 for the establishment of an Agricultural Experiment Station. This was supplemented in 1906 by a similar act known as the Adams Act, which carried an annual appropriation of $15,000 for the use of the Agricultural Experiment Stations that had been established under the law of 1887.

The Experiment Station has a library, research laboratories, and a separate organization staff. It is investigating problems in the fields of Agronomy, Horticulture,

Chemistry, Plant Pathology, Soil Bacteriology, and Animal Husbandry. The results of its investigations are published in the form of bulletins, which are distributed free of charge to those interested.

The Women's College of Delaware

Affiliated with Delaware College is The Women's College of Delaware, established by the State in September, 1914. The college offers three courses of instruction leading to degrees:

I **Arts and Science,** a four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Education,** a four years' course leading to the degree of Bachelor of Science.

III **Home Economics,** a four years' course leading to the degree of Bachelor of Science.

In addition to these regular courses, instruction in Agriculture will be offered if a sufficient number of students apply. Tuition is free to students from the State of Delaware. Information in regard to the college may be obtained from the Dean of the Women's College.

REQUIREMENTS FOR ADMISSION

Students are admitted either upon examination at the college, or upon certificates from accredited schools or from other colleges or universities. Examinations are held in June and September, according to the schedule on page 27. Certificates from schools should be presented as early as possible during the summer preceding the session of the college which students wish to attend. Blank certificates may be had upon application to the Dean of Delaware College, Newark, Delaware.

GENERAL REGULATIONS

Candidates for admission to the Freshman class must be at least 16 years of age and of good moral character. They must either (1) be graduates of standard four-year high or preparatory schools, or (2) have spent four full years as students in such high schools* and in addition sustain examinations at the college in **all** subjects which they present for entrance. The examinations are given on the days prescribed in the calendar of the college. All candidates, whether or no graduates of high schools, are required to present 14 units as entrance credits.

Students should enter at the **beginning of the first term,** because the subjects which are begun at that time are not repeated in the second term. No student will be permitted to enter the college in the first term after September 30, unless he has completed an amount of work equivalent to the work already done by the classes which he wishes to enter.

All applications and credentials should be in the hands of the Entrance Committee at the earliest possible moment.

SPECIFIC REQUIREMENTS

Fourteen units are required for entrance to any course. No student will be admitted with more than two conditions. The term **unit** means the equivalent of five recitations a week for one year in one subject.

The following units are required of all applicants:

English	3	units
Mathematics (Algebra and Plane Geometry)	2½	"
Modern Language	2	"
History	1	unit
Science	1	"
Total	9½	units

*Exceptions to this time-requirement will be made only in the cases of mature applicants who, in the judgment of the Entrance Committee, are qualified to do college work.

Additional units to the number of 4½ must be offered from the following list:

Mathematics	
Solid Geometry	½ unit
Foreign Languages	
Greek	1, 2, 3, or 4 units
Latin	1, 2, 3, or 4 units
German	1, 2, 3, or 4 units
French	1, 2, 3, or 4 units
History	
Ancient	1 unit
Mediaeval and Modern	1 unit
English	1 unit
United States	½ or 1 unit
Civics	½ unit
Science	
Botany	½ or 1 unit
Chemistry	1 unit
Physics	1 unit
Physical Geography	½ or 1 unit
Physiology	½ unit
Zoology	½ or 1 unit
Vocational Subjects	See Note 4

Note 1. Candidates for the degree of A. B., in the Arts and Science course, must offer four units of Latin or Greek for entrance, or take a condition in one or both of these subjects not exceeding two units.

Note 2. The required science for candidates for admission to courses in Engineering is Physics.

Note 3. All candidates for admission are examined in English Composition in order to test their ability to do the required English of the Freshman year. Examinations are held in June and September. Candidates are advised to take the examination in June. Those who fail will have

the opportunity of working privately on the subject during the summer or of taking a course in English in the six weeks' Summer Session.

Note 4. Units in vocational subjects to the number of three will be accepted from graduates of the four-year Smith-Hughes High School Course. Graduates from this course may also substitute two units from the list on page 19 for the regular entrance requirement in Modern Language.

Note 5. Conditions in Modern Language must be made up by means of additional work in college.

Detailed Explanation of the Requirements for Admission

English

Requirements for 1920, 1921, and 1922 *

The study of English in school has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

English Grammar and Composition

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description, and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted efforts of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

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* Copies of entrance requirements in English for 1923, 1924, and 1925 may be had on application to the Department of English.

Literature

The second object is sought by means of two lists of books, headed respectively *Reading* and *Study,* from which may be framed a progressive course in literature covering four years. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

(a) *Reading.* The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units[1] are to be selected, two from each group:

Group I The Old Testament, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther[2]; the Odyssey, with the omission, if desired, of books I, II, III, IV, V, XV, XVI, XVII; the Iliad, with the omission, if desired, of books XI, XIII, XIV, XV, XVII, XXI; Vergil's Aeneid. The Odyssey, Iliad, and Aeneid should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group II Shakspere: Merchant of Venice; The Tempest; As You Like It; Twelfth Night; Midsummer Night's Dream; Romeo and Juliet; King John; Richard II; Richard III; Henry V; Coriolanus; Julius Caesar; Macbeth; Hamlet.

Group III Prose Fiction. Malory's Morte d'Arthur (about 100 pages); Bunyan's Pilgrim's Progress, Part I; Swift's Gulliver's Travels (voyages to Lilliput and Brobdingnag); DeFoe's Robinson Crusoe, Part I, Goldsmith's Vicar of Wakefield; Frances Burney's Evelina; Scott's Novels (any one); Jane Austen's Novels (any one); Maria Edgeworth's Castle Rackrent, or The Absentee; Dickens' Novels (any one); Thackeray's Novels (any one); George Eliot's Novels (any one); Mrs. Gaskell's Cranford; Kingsley's Westward Ho!, or Hereward the Wake; Reade's The Cloister and the

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1 Each unit is set off by semicolons.
2 See Delaware College Bulletin, N. S., vol. 12, No. 1, 1916.

Hearth; Blackmore's Lorna Doone; Hughes' Tom Brown's School-days; Stevenson's Treasure Island, or Kidnapped, or The Master of Ballantrae; Cooper's Novels (any one); Poe's Selected Tales; Hawthorne's The House of the Seven Gables, or Twice Told Tales, or Mosses from an Old Manse; a collection of Short-Stories by various standard writers.

Group IV Essays, Biography, etc. Addison and Steele's The Sir Roger de Coverly Papers, or Selections from the Tatler and Spectator (about 200 pages); Selections from Boswell's Life of Johnson (about 200 pages); Franklin's Autobiography; Irving's Sketch Book (about 200 pages), or Life of Goldsmith; Southey's Life of Nelson; Lamb's Essays of Elia (about 100 pages); Lockhart's Life of Scott (about 200 pages); Thackeray's Lectures on Swift, Addison, and Steele in English Humorists; Macaulay's Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederic the Great, Madame d'Arblay (any one); Trevelyan's Life of Macaulay (about 200 pages); Ruskin's Sesame and Lilies, or Selections (about 150 pages); Dana's Two Years before the Mast; Selections from Lincoln including at least the two inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, and the Letter to Horace Greeley, together with a brief memoir or estimate; Parkman's The Oregon Trail; Thoreau's Walden; Lowell's Selected Essays (about 150 pages); Holmes' The Autocrat of the Breakfast Table; Stevenson's An Inland Voyage, and Travels with a Donkey; Huxley's Autobiography, and selections from Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; a collection of Essays by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of Letters by various standard writers.

Group V Poetry. Palgrave's Treasury (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's Golden Treasury (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley, if not chosen for study under (*b*); Goldsmith's The Traveler, and The Deserted Village; Pope's The Rape of the Lock; A collection of English and Scottish ballads, as, for example, some Robin Hood ballads, The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens, and a selection from later ballads; Coleridge's The Ancient Mariner, Christabel, and Kubla Khan; Byron's Childe Harold, Canto III or IV, and The Prisoner of Chillon; Scott's The Lady of the Lake, or Marmion; Macaulay's The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry; Tennyson's The Princess, or Gareth and Lynette, Lancelot and Elaine, and The Passing of Arthur; Browning's Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My

Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus—, Instans Tyrannus; Arnold's Sohrab and Rustum, and The Forsaken Merman; Selections from American poetry, with special attention to Poe, Lowell, Longfellow, and Whittier.

(b) *Study.* This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

Group I Drama. Shakspere's Julius Caesar, Macbeth, Hamlet.

Group II Poetry. Milton's L'Allegro, Il Penseroso, and either Comus or Lycidas; Tennyson's The Coming of Arthur, The Holy Grail, and The Passing of Arthur; the selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's Golden Treasury (First Series).

Group III Oratory. Burke's Speech on Conciliation with America; Macaulay's Two Speeches on Copyright, and Lincoln's Speech at Cooper Union; Washington's Farewell Address, and Webster's First Bunker Hill Oration.

Group IV Essays. Carlyle's Essay on Burns, with a selection from Burns' poems; Macaulay's Life of Johnson; Emerson's Essay on Manners.

Examination

However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling, or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies, and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words per hour.

The examination in literature will include:

A General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under (a) *Reading* above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

B A test on the books prescribed for (b) *Study*, which will consist of questions upon their content, form, and structure, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their works, and the periods of literary history to which they belong.

History and Civics

(a) History. Ancient, Mediaeval and Modern, English, United States. The requirement is a regular year's work in one of these subjects.

(b) Civics. Whether given separately or in connection with United States History, this work must be the equivalent of a regular course pursued for a half-year. Considerable attention should be given to the actual workings of government.

Mathematics

(a) Algebra. The four fundamental operations, with emphasis placed upon type forms in multiplication and division, factoring, highest common factor, least common multiple, fractions, fractional equations, simultaneous equations of first degree, evolution, theory of exponents, radicals, quadratic equations of one unknown quantity, and solution of problems. Emphasis should be placed on factoring and solution of literal equations.

(b) Plane Geometry. The usual theorems and constructions of good text books. An important part of the work consists in the solution of original exercises, including loci, and numerical problems. Accuracy and acuteness in thinking are desired more than mere geometrical knowledge.

(c) Solid Geometry. The usual theorems and constructions of good text books; relations of lines and planes; properties of prisms, pyramids, cylinders, cones; the sphere and spherical triangle. Emphasis should be placed on problems of mensuration, loci, and the relation of parts in spherical triangles and polygons.

(d) Advanced Algebra. Convergency and Summation of Series, Binomial Theorem, Permutations and Combinations, Undetermined Coefficients, Logarithms, Theory of Equations, and Determinants.

(e) Plane Trigonometry. Trigonometric ratios and their relations; derivation of general ratios; proofs of general formulas, especially trigonometric functions of sum of two angles, difference of two angles, and multiple angles; proving of identities; use of logarithms and solution of right and oblique triangles.

Physics

Candidates for admission who bring certificates from an accredited high school stating that they have completed one year's work of five recitations a week covering the elementary principles of Physics and including laboratory exercises of at least two hours a week will be accepted as satisfying the entrance requirements in Physics.

As a requirement for admission of other applicants, in addition to passing an examination in the subject as covered in an ordinary high school text book on Physics, they must submit satisfactory notes on the laboratory work they may have done.

Latin

1 The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall not be less in amount than Caesar, Gallic War, I—IV; Cicero, the orations against Catiline, for Manilian Law, and for Archias; Vergil, Aeneid, I—VI.

2 The amount of reading specified above shall be selected by the schools from the following authors and works: Caesar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters, and De Senectute) and Sallust (Catiline and Jugurthine War); Vergil (Bucolics, Georgics, and Aeneid) and Ovid (Metamorphoses, Fasti, and Tristia).

3 Grammar and Composition. The examination in grammar and composition will demand a thorough knowledge of all irregular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The Roman method of pronunciation is used.

Greek

Xenophon, Anabasis, Books I—IV. Homer, Iliad, Books I—III. A thorough knowledge of Greek Grammar.

Modern Languages

(a) German, Elementary. 1, Careful drill in pronunciation; 2, the memorizing and frequent repetition of easy colloquial sentences; 3, drill upon the rudiments of grammar, that is, upon the inflection of the articles, of such nouns as belong to the language of every-day life, of adjectives, pronouns, weak verbs, and the more usual strong verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word order; 4, abundant easy exercises designed not only to fix in mind the forms and the principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression; 5, the reading of from 100 to 125 pages of graduated texts.

(b) German, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in German (b) will not be given credit for it unless they have passed the examination in German (a).

Applications should be accompanied by a statement of the text books used and the number of pages translated.

(a) French, Elementary. 1, Careful drill in pronunciation; 2, the rudiments of grammar, including the inflection of the regular and the more common irregular verbs, the plural nouns, the inflection of adjectives, participles, and pronouns; the use of the personal pronouns, common adverbs, prepositions, and conjunctions; the order of words in the sentence, and the elementary rules of syntax; 3, abundant easy exercises, designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in reproduction of natural forms of expression; 4, the reading of from 100 to 125 pages of graduated texts.

(b) French, Second Year. Careful review of grammar. Supplementary exercises in connected prose composition. Ability to translate ordinary English prose. The reading of from 300 to 400 pages of selected texts.

Students who present themselves for examination in French (b) will not be given credit for it unless they have passed also the examination in French (a).

Applications should be accompanied by a statement of the text books used and the number of pages translated.

Science

One year's work of 36 weeks, five recitations weekly, of high school grade, covering the elementary principles of any one of the

several sciences, will be accepted as an entrance requirement. The student, in addition to the examination, must submit his notes on laboratory or field work of the year.

ADMISSION TO ADVANCED STANDING

Candidates for entrance to an advanced class in any of the courses are required either to sustain examinations in all studies of the course up to the point at which they seek admission, or to present from other colleges certificates covering such studies.

ENTRANCE EXAMINATIONS

Entrance examinations will be held at the college in Newark on Wednesday and Thursday, June 16 and 17, 1920, beginning at 9 a. m.; also on Tuesday and Wednesday, September 14 and 15, 1920, at the same hours.

Ancient History or English History—9.00-10.30, Wednesday, June 16, and Tuesday, September 14.

Algebra—10.30-12.30, Wednesday, June 16, and Tuesday, September 14.

Geometry—1.30-3.00, Wednesday, June 16, and Tuesday, September 14.

Latin—3.15-4.30, Wednesday, June 16, and Tuesday, September 14.

Greek and Physics—9.00-10.30, Thursday, June 17, and Wednesday, September 15.

English—10.30-12.30, Thursday, June 17, and Wednesday, September 15.

History of the United States and Civil Government—1.15-2.45, Thursday, June 17, and Wednesday, September 15.

Solid Geometry—2.45-4.30, Thursday, June 17, and Wednesday, September 15.

Hours for examinations in other subjects will be arranged for with the candidates who offer such subjects.

COURSES OF STUDY

Delaware College offers the following courses of study:

I **Arts and Science**—A four years' course leading to the degree of Bachelor of Arts or Bachelor of Science.

II **Agriculture**—A four years' course leading to the degree of Bachelor of Science in Agriculture.

III **Engineering** — Civil, Mechanical, Electrical, Chemical, Marine Transportation—A four years' course leading to the degree of Bachelor of Science in the special field of study.

CHOICE OF STUDY

Students may, with the approval of their parents or guardians, enter any one of the departments; or they may select such studies as they are prepared to pursue, when circumstances make it advisable not to enter a regular course. Except in the case of mature students who may desire to do special work in any department, it is strongly urged that all students for admission prepare themselves for undertaking the work of a regular course. Opportunity is offered students of sufficient maturity and preparation, who do not wish to take any of the regular courses, to pursue special studies determined by some definite end in view.

Each special student is required to have at least fifteen recitations, or their equivalent, weekly, unless especially excused for cause.

Changes from one course to another may be made only at the opening of a term, with the approval of the Faculty and the consent of the parent or guardian.

QUALITATIVE REQUIREMENTS FOR GRADUATION IN ALL COURSES

In addition to fulfilling the specific requirements as laid down under each general course of study, candidates for graduation must also attain the grade of B or better in at least 50 per cent of the work undertaken.

COURSE IN ARTS AND SCIENCE

This course is designed to meet the requirements of a liberal education and to lay the foundation for professional and business careers. In accordance with this general aim considerable freedom in the choice of studies is allowed, particularly in the last two years of the course. The studies of the Freshman year are virtually prescribed.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 128 credit term-hours of work in addition to Military Science. During the Senior year, every candidate for graduation must submit a satisfactory thesis to the head of the Department in which he has taken his major.

Graduates from the course in Arts and Science who have offered for admission four years of Latin or Greek, or who have completed in college an equivalent amount of work will receive the degree of Bachelor of Arts; all other graduates will receive the degree of Bachelor of Science.

Prescribed Studies

	Credits
English	16
Mathematics	8
Modern Language	12
Science (Chemistry, Zoology, Botany, or Physics)	12
History and Economics	12
	—
	60
Military Drill	6

FRESHMAN YEAR

First Term	H.*	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Mathematics, ...	4	4	Mathematics, ...	4	4
Language—Latin, French, or German..	3	3	Language—Latin, French, or German..	3	3
History, 1	3	3	History, 2	3	3
Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6	Elective—Two subjects: (Botany, Zoology, Physics, Chemistry, Greek, Latin)		6
Military Science, 1....	3	1.5	Military Science, 2....	3	1.5

SOPHOMORE, JUNIOR, AND SENIOR YEARS

At the beginning of the Sophomore year, every candidate for the degree of Bachelor of Arts or Bachelor of Science shall select from the following groups a major study, in which he shall complete thereafter 18 hours of work. In addition, he must take from the group from which he selects his major at least one additional course after the Freshman year.

During these three years students must take in addition to the required work in Military Science all prescribed subjects not completed in the Freshman year and elective courses sufficient to make a total of thirty credit term-hours each year.

Group A	**Group B**
Greek or Latin	Biology
French or German	Chemistry
English	Mathematics and Physics
History	
Business Administration	
Education	

* The capital letters H. and C. refer to Actual Hours and Credit Hours, respectively.

Elective Courses

	1st Term	2nd Term
Ancient Languages, 1, 2, 3, 4, 5, 6, 7, 8.....	3	3
Ancient Languages, 21, 22, 23, 24, 31, 32.....	3	3
Bacteriology, 1 and 2..	3	3
Bacteriology, 3.....	3	
Biology, 1, 2, 3, 4.....	3	3
Biology, 5, 6, 7, 8.....	2	2
Business, 1, 2, 3, 4.....	3	3
Business, 5, 6, 7, 8....	3	3
Chemistry, see pages 53-55		
Economics, 1, 2.....	3	3
Education, 3	3	–
Education, 7, 8.....	3	3
English, 11	3	–
English, 17, 22.....	3	3
English, 39, 32.....	3	3
History, 9, 10.....	3	3
History, 11, 12.....	3	3
History, 21 and 22....	3	3
History, 29 and 30....	3	3
Horticulture, 33	3	–
Hygiene, 3 and 4.....	1	1
Mathematics, 5, 6.....	6	6
Mathematics, 9 and 10.	3	3
Mathematics, 13	2	–
Mathematics, 20	–	2
Mathematics, 21, 22...	3	3
Mineralogy, 31, 32....	3	3
Modern Languages, see pages 78-82		
Physics, 1, 2.....	3	3
Physics, 3, 4.....	1.5	1.5
Physics, 10	–	3.5
Physiology, 1, 2.....	3	3
Psychology, 1, 2.....	3	3
Psychology, 3.....	3	—
Sociology, 1, 2.....	3	3

COURSE IN AGRICULTURE

The course in Agriculture combines a technical course in Agriculture with as much cultural training as possible. Agriculture is viewed as applied science and the course is planned to give the student a broad foundation in the fundamental sciences which underlie modern agricultural practice.

The aim of the course is to train and develop men to become farm managers, vocational teachers, or specialists in some of the various phases of agriculture.

REQUIREMENTS FOR GRADUATION

Candidates for graduation are required to complete 138 credit term-hours of work in addition to Military Science. All Agricultural students will be required to spend at least six months, or their equivalent, before the Senior year, in practice work on a farm. All candidates for a degree in Agriculture must pass an examination in farm practice before December 1 of the Senior year.

Candidates for a degree in Agriculture must at the beginning of the Junior year register with the Dean of Agriculture as students majoring in Agronomy, Animal Husbandry, Horticulture, or Vocational Agricultural Education. A minimum of 25 credit term-hours must be taken in the department in which the student is majoring, except in Vocational Education, where 15 credits are required. The student should consult with the head of the department in which he is taking his major work, regarding his selection of elective subjects during his Junior and Senior years.

Except by special permission from the Dean of Agriculture, Sophomores, Juniors, and Seniors will not be allowed to take in any one term more than 20 credit hours, and Freshmen more than 18 credit hours, exclusive of Military Science.

Prescribed Studies

	Credits
English, 1, 2, 3 and 4	10
Biology, 1, 2, 7 and 8	12
Chemistry, 11, 12, 15, 21, 22, 23 and 26	21
History, 3 and 21	4
Business, 1 and 2	6
Bacteriology, 1 and 2	6
Physics, 1 and 3	4.5
Plant Pathology, 2; or Hygiene, 2	3
Farm Management, Agr., 6	3
Genetics, Hort., 33	3
Agronomy, 1, 4 and 5	9
Animal Husbandry, 17, 18 and 19	9
Horticulture, 16, 17 and 18	9
Seminars	2
Elective Agricultural Subjects	14
Free Electives	22.5
Total	138

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Biology, 7	5	3	Biology, 8	5	3
Chemistry, 11	2	2	Chemistry, 12	2	2
Chemistry, 15	6	3	Horticulture, 16	4	3
Agronomy, 1	4	3	Animal Husbandry, 18	4	3
Animal Husbandry, 17	4	3	Elective Agriculture	–	3
Military Science, 1	3	1.5	Military Science, 2	3	1.5
Physical Training, 1	1	0.5	Physical Training, 2	1	0.5
	27	18.5		21	18.5

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 3	2	2	English, 4	2	2
History, 3	1	1	Chemistry, 22	5	3
Chemistry, 21	5	3	Chemistry, 26	5	5
Chemistry, 23	6	3	Agronomy, 4	5	5
Physics, 1, 3	6	4.5	Horticulture, 18	4	3
Horticulture, 17	4	3	Elective Agriculture	–	3
Animal Husbandry, 19	4	3	Military Science, 4	3	1.5
Military Science, 3	3	1.5		24	22.5
	31	20			

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
Business, 1	3	3	Business, 2	3	3
Bacteriology, 1	5	3	Bacteriology, 2	5	3
Agronomy, 5	5	3	Hygiene, 2, or		
Horticulture, 33	3	3	Plant Pathology, 2	5	3
Biology, 1	5	3	Biology, 2	5	3
Elective	–	3	Electives	–	6
Military Science, 5	3	1.5	Military Science, 6	3	1.5
	24	19.5		21	19.5

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
History, 21	3	3	Agronomy, 6	5	3
Seminar	2	1	Seminar	2	1
Electives	–	14	Electives	–	14
Military Science, 7	3	1.5	Military Science, 8	3	1.5
	8	19.5		10	19.5

SHORT COURSE IN AGRICULTURE

A short course in Agriculture extending over a period of approximately one week will be given during the winter of 1920-21.

COURSES IN ENGINEERING

CIVIL ENGINEERING

The Department of Civil Engineering provides a rigorous training in the fundamentals of civil engineering, supplemented by studies of a distinctly broadening character. The aim of the course is to develop men who can creditably fill positions where a breadth of view and a thorough training are prime requisites.

In the fourth year, one and only one of the two options must be taken. The options provide a solid basis for Municipal or Highway work.

Freshmen and Sophomores are required to attend the summer school of Surveying, which will be held during the two weeks immediately after the close of college in June.

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Modern Language, 1 or 63	3	3	Modern Language, 2 or 64	3	3
Mathematics, 15	4	4	Mathematics, 16	7	5.5
Chemistry, 11	2	2	Chemistry, 12	2	2
Chemistry, 15	6	3	Civil Engineering, 22	3	1.5
Mech. Engineering, 21	5	3.5	Mech. Engineering, 22	5	3.5
Mech. Engineering, 57	3	1	Mech. Engineering, 58	3	1
Military Science, 1	3	1.5	Military Science, 2	3	1.5
	29	21		29	21

SOPHOMORE YEAR

First Term	H.	C.
English, 3	2	2
Modern Language, 3 or 65	3	3
Mathematics, 5	6	6
Physics, 5	5	5
Physics, 7	3	1.5
Civil Engineering, 23	4	2.5
Mech. Engineering, 33	3	1.5
Military Science, 3	3	1.5
	29	23

Second Term	H.	C.
English, 4	2	2
Modern Language, 4 or 66	3	3
Mathematics, 6	6	6
Physics, 6	5	5
Physics, 8	3	1.5
Civil Engineering, 24	4	2.5
Mech. Engineering, 34	3	1.5
Military Science, 4	3	1.5
	29	23

JUNIOR YEAR

First Term	H.	C.
Hygiene, 3	1	1
*Mineralogy, 31	3	3
*History, 5		
Mathematics, 11	6	6
Civil Engineering, 25	7	5.5
Civil Engineering, 27	3	1.5
Civil Engineering, 29	3	1.5
Elec. Engineering, 11	2	2
Mech. Engineering, 1	3	3
Military Science, 5	3	1.5
	31	25

Second Term	H	C.
Hygiene, 4	1	1
*Mineralogy, 32	3	3
*History, 6		
Mathematics, 12	6	6
Civil Engineering, 26	5	3.5
Civil Engineering, 18	3	3
Mech. Engineering, 2	3	3
Military Science, 6	3	1.5
	25	21

SENIOR YEAR

First Term	H.	C.
English, 7	1	1
Business Admin., 3	3	3
*Mineralogy, 31	3	3
*History, 5		
Civil Engineering, 5	4	4
Civil Engineering, 7	4	4
Civil Engineering, 9	6	4.5
Military Science, 7	3	1.5
Civil Engineering, 15	4	4
	29	26

Second Term	H.	C.
English, 8	1	1
Business Admin., 4	3	3
*Mineralogy, 32	3	3
*History, 6		
Civil Engineering, 30	4	2
Civil Engineering, 42	3	3
Mech. Engineering, 46	6	3
Military Science, 8	3	1.5
Civil Engineering, 16	4	4
Civil Engineering, 32	2	2
	33	26.5

Options (Municipal)

* Mineralogy 31 and 32 and History 5 and 6 are given in alternate years.

HIGHWAY

Civil Engineering, 13..	4	4
	29	26

Civil Engineering, 14..	4	4
Civil Engineering, 34..	5	2.5
	36	27

MECHANICAL AND ELECTRICAL ENGINEERING

This department offers two courses, one in Mechanical Engineering and one in Electrical Engineering, each leading to the degree of Bachelor of Science. The courses are designed to teach the principles of Mechanical and Electrical Engineering and to train young men to meet successfully the problems which an engineer may encounter. Besides offering instruction in purely technical studies, the courses also provide the elements of a liberal education, including the subjects of English Composition, oral and written, English Literature, History, French or German, Mathematics, Physics, and Chemistry.

Both courses are the same for the first three years. During the fourth year, students who take one course or the other pursue separately the subjects pertaining to their particular course. Many studies, however, remain common to both courses.

The department has a wood-working and machine shop and mechanical and electrical laboratories.

Students are required to furnish all instruments and materials used in the drafting-room. The materials must conform strictly to the requirements of the department, and the instruments must meet with the approval of the instructor.

Every candidate for graduation is required to present a satisfactory thesis which shall embody the results of some investigation which he has personally made. The theses must be typewritten and must be accompanied by such drawings and other sheets as are necessary to illustrate and explain the subject. The theses must be approved by the English Department before they will be accepted.

Requirements for Graduation

FRESHMAN YEAR

First Term	H.	C.
English, 1	3	3
Modern Language, 1 or 63	3	3
Mathematics, 15	4	4
Chemistry, 11	2	2
Chemistry, 15	6	3
Mech. Engineering, 21	5	3.5
Mech. Engineering, 51	3	1
History, 3	1	1
Military Science, 1	3	1.5
	30	22

Second Term	H.	C.
English, 2	3	3
Modern Language, 2 or 64	3	3
Mathematics, 16	7	5.5
Civil Engineering, 22	3	1.5
Chemistry, 12	2	2
Mech. Engineering, 22	5	3.5
Mech. Engineering, 52	3	1
Military Science, 2	3	1.5
	29	21

SOPHOMORE YEAR

First Term	H.	C.
English, 3	2	2
Modern Language, 3 or 65	3	3
Mathematics, 5	6	6
Physics, 5	5	5
Physics, 7	3	1.5
Mech. Engineering, 25	6	3
Mech. Engineering, 53	3	1
Military Science, 3	3	1.5
	31	23

Second Term	H.	C.
English, 4	2	2
Modern Language, 4 or 66	3	3
Mathematics, 6	6	6
Physics, 6	5	5
Physics, 8	3	1.5
Mech. Engineering, 26	6	3
Mech. Engineering, 54	3	1
Military Science, 4	3	1.5
	31	23

JUNIOR YEAR

First Term	H.	C.
Mathematics, 11	6	6
Mech. Engineering, 55	3	1
Elec. Engineering, 1	3	3
Elec. Engineering, 41	3	1.5
Mech. Engineering, 35	3	1.5
Civil Engineering, 29	3	1.5
Mech. Engineering, ...	1	3
Mech. Engineering, 29	4	3
Military Science, 5	3	1.5
	28	19

Second Term	H.	C.
Mathematics, 12	6	6
Mech. Engineering, 56	3	1
Elec. Engineering, 2	3	3
Elec. Engineering, 42	3	1.5
Mech. Engineering, 36	3	1.5
Mech. Engineering, 2	3	3
Mech. Engineering, 30	4	3
Mech. Engineering, 48	3	1.5
Military Science, 6	3	1.5
	31	22

SENIOR YEAR—MECHANICAL ENGINEERING

First Term	H.	C.
English, 7	1	1
Civil Engineering, 7	4	4
Mech. Engineering, 3	2	2
Mech. Engineering, 5	4	4
Mech. Engineering, 7	2	2
Mech. Engineering, 31	6	3
Mech. Engineering, 41	6	3
Elec. Engineering, 7	3	3
Elec. Engineering, 3	3	3
Elec. Engineering, 45	3	1.5
Military Science, 7	3	1.5
	37	28

Second Term	H.	C.
English, 8	1	1
Civil Engineering, 8	4	4
Mech. Engineering, 4	2	2
Mech. Engineering, 6	4	4
Mech. Engineering, 8	2	2
Mech. Engineering, 32	6	3
Mech. Engineering, 42	6	3
Elec. Engineering, 4	3	3
Elec. Engineering, 46	3	1.5
Military Science, 8	3	1.5
	34	25

SENIOR YEAR—ELECTRICAL ENGINEERING

First Term	H.	C.
English, 7	1	1
Civil Engineering, 7	4	4
Mech. Engineering, 7	3	1.5
Mech. Engineering, 5	2	2
Mech. Engineering, 43	3	1.5
Elec. Engineering, 3	3	3
Elec. Engineering, 7	2	2
Elec. Engineering, 31	3	1.5
Elec. Engineering, 43	6	3
Military Science, 7	3	1.5
	31	23.5

Second Term	H.	C.
English, 8	1	1
Civil Engineering, 8	4	4
Mech. Engineering, 6	4	4
Mech. Engineering, 44	3	1.5
Elec. Engineering, 4	3	3
Elec. Engineering, 8	2	2
Elec. Engineering, 6	2	2
Elec. Engineering, 44	6	3
Military Science, 8	3	1.5
	28	22

CHEMICAL ENGINEERING

The course in Chemical Engineering is designed to give thorough instruction in Chemistry, and also in some of the more important engineering branches. In addition to the general instruction in Chemistry, it includes special work in chemical analysis, organic preparations, industrial chemistry, with the analysis of some of the more important materials and products, water analysis, and gas analysis. It also includes such branches of mechanical and electrical engineering as are particularly useful in the management of manufacturing establishments. Aside from its special purpose, this course offers an excellent scientific education. Every candidate for graduation may be required to prepare in his Senior year a thesis giving the results of his own

investigations of some approved subject. This course leads to the degree of Bachelor of Science in Chemical Engineering.

FRESHMAN YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 1	3	3	English, 2	3	3
Mod. Language, 1 or 63	3	3	Mod. Language, 2 or 64	3	3
History, 3	1	1	Mathematics, 16	7	5.5
Mathematics, 15	4	4	Mech. Engineering, 22.	5	3.5
Mech. Engineering, 21.	5	3.5	Mech. Engineering, 58.	3	1
Mech. Engineering, 57.	3	1	Chemistry, 16	6	3
Chemistry, 15	6	3	Chemistry, 12	2	2
Chemistry, 11	2	2	Military Science, 2	3	1.5
Military Science, 1	3	1.5			
	30	22		32	22.5

SOPHOMORE YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 3	2	2	English, 4	2	2
Mod. Language, 3 or 65	3	3	Mod. Language, 4 or 66	3	3
Mathematics, 5	6	6	Mathematics, 6	6	6
Physics, 5	5	5	Physics, 6	5	5
Physics, 7	3	1.5	Physics, 8	3	1.5
Chemistry, 21	3	3	Chemistry, 22	3	3
Chemistry, 23	6	3	Chemistry, 24	6	3
Mech. Engineering, 33.	3	1.5	Mech. Engineering, 34.	3	1.5
Mech. Engineering, 59.	3	1	Military Science, 4	3	1.5
Military Science, 3	3	1.5			
	37	27.5		34	26.5

JUNIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
*Mineralogy, 31 or *Chemistry, 31	3	3	*Mineralogy, 32 or *Chemistry, 32	3	3
Chemistry, 33	2	2	Chemistry, 34	2	2
Chemistry, 35	6	3	Chemistry, 36	6	3
Chemistry, 37	2	1	Chemistry, 38	2	1
Mathematics, 11	6	6	Mathematics, 12	6	6
Elec. Engineering, 1	3	3	Elec. Engineering, 2	3	3
Elec. Engineering, 41	3	1.5	Elec. Engineering, 42	3	1.5
Mech. Engineering, 1	3	3	Mech. Engineering, 2	3	3
Military Science, 5	3	1.5	Military Science, 6	3	1.5
	31	24		31	24

*Chemistry 31 and 32 and Mineralogy 31 and 32 are given in alternate years.

SENIOR YEAR

First Term	H.	C.	*Second Term*	H.	C.
English, 7	1	1	English, 8	1	1
*Mineralogy, 31 or *Chemistry, 31	3	3	*Mineralogy, 32 or *Chemistry, 32	3	3
Chemistry, 41	3	3	Chemistry, 42	3	3
Chemistry, 43	3	3	Chemistry, 44	3	3
Chemistry, 47	6	3	Chemistry, 48	6	3
Civil Engineering, 5	4	4	Mech. Engineering, 46	6	3
Mech. Engineering, 3	2	2	Mech. Engineering, 4	2	2
Non-tech. subjects	3	3	Non-tech. subjects	3	3
Military Science, 7	3	1.5	Military Science, 8	3	1.5
	28	23.5		30	22.5

MARINE TRANSPORTATION

FRESHMAN YEAR

First Term	H.	*Second Term*	H.
English Composition	3	English Composition	3
Modern Language	3	Modern Language	3
Algebra and Trigonometry	4	Elem. of Eng. Computation	3
Chemistry (Inorganic)	5	Spherical Trigonometry	1
Descriptive Geometry	4	Chemistry (Inorganic)	2
Mechanical Drawing	3	Des. Geom. and Mechanical Drawing	7
Shopwork	3	Shopwork	3
Drill	3	Drill	3
American Government	2	American Government	2
	30		30

Summer in Shipbuilding Plant in Machine Shop

SOPHOMORE YEAR

First Term	H.	*Second Term*	H.
English Literature	2	English Literature	2
Modern Language	3	Modern Language	3
Analytics	4	Calculus	4
Physics	8	Physics	8
Engineering Drawing	3	Engineering Drawing	3
Economics	3	Economics	3
Drill	3	Drill	3
	26		26

Summer in Shipbuilding Plant in the Boatyard

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*Chemistry 31 and 32 and Mineralogy 31 and 32 are given in alternate years.

JUNIOR YEAR

First Term	H.	*Second Term*	H.
Calculus	3	Elementary Hull Const.	3
Mechanics of Engineering	3	Mechanics of Engineering	3
Kinematics	2	Kinematics	2
Graphics	2	Graphics	2
Practical Astronomy	2	Practical Navigation	2
Direct Currents	6	Alternating Currents	6
International Law	2	Foreign Exchange Banking	2
European History	3	Transportation	3
Steam Boilers	2	Steam Boilers	2
Drill	3	Drill	3
	28		28

Summer in Engine Erection in Shipyard

SENIOR YEAR

First Term	H.	*Second Term*	H.
English Technical Reports	1	English Technical Reports	1
Mechanics of Materials	4	Mechanics of Materials	4
Testing Laboratory	3	Electrical Laboratory	6
Machine Design	6	Machine Design	6
Markets	3	International Trade	3
Hull Construction	3	Hull Construction	3
Steam Engines	4	Steam Engines	2
Business Administration	3	Business Finance	3
Drill	3	Drill	3
	30		30

ADVANCED DEGREES

The degree of Master of Arts or Master of Science will be awarded upon the satisfactory completion of a resident course of study in Arts, Science, Agriculture, or Engineering extending over not less than one year. At the beginning of the year in which he expects the degree the student shall select a major subject and one or two minor subjects, and he shall take in these subjects the equivalent of at least twelve hours' work.

A graduate of any of the courses in Engineering will, after three years of practical and successful work as an Engineer, be entitled to the professional degree of C. E., M. E., E. E., or Ch. E., according to the course he may have

pursued. One college year before coming up for the degree the candidate must signify his intention, and also map out a definite and satisfactory course of work.

An incidental fee of $10 must be paid by the candidate for a higher degree before he will be admitted to the final examinations.

SUBJECTS OF INSTRUCTION

In this detailed statement of the subjects of instruction the number of credit term-hours is printed in italics at the end of each course. Not less than two hours and not more than three hours of laboratory work are counted as equivalent to one credit hour, the exact equivalent depending on the nature of the work and the amount of outside preparation required.

Odd numbers are assigned to first term courses; even numbers, to second term courses.

Agronomy

PROFESSOR ——— AND ASSISTANT PROFESSOR FRIANT

Agronomy is the science of the field, the soil, and its crops. The soil is studied with reference to its functions as the home of the plant. The fundamental principles of soil management for crop production are especially emphasized. The study of soils presupposes a fair understanding of the principles of physics, chemistry, and plant physiology. Field crops are studied from the standpoint of the adaptation and improvement of plants. A study is made of the economical and business management of the field and its crops. The study of field crops presupposes a general knowledge of botany. A field of twenty-five acres devoted to experimental and research work in Agronomy is used to supplement class and laboratory work. At least one visit to representative farms of the State will be required of Juniors and Seniors in Agronomy.

Agr 1 Field Crop Production. A general course dealing with the history, adaptation, distribution, and classification of cereal and forage crops. Special attention is given to the principles of cultivation, and to the methods of harvesting and marketing which prevail under Eastern conditions. Two lectures and two laboratory hours.

ASSISTANT PROFESSOR FRIANT *Three credit hours*

Agr 2 Cereal Crops. (Prerequisites: Agr 1; B 7 and 8). The cultivation, harvesting, and marketing of grain crops. Attention in detail is given to the various methods of production and to the cost. Varieties and types of grain groups are considered, together with the principles of

improvement by selection and breeding. Judging of corn, wheat, oats, etc., and a study of market grades and classification; preservation and testing of field crop seeds. Two lectures and two laboratory hours.

ASSISTANT PROFESSOR FRIANT *Three credit hours*

Agr 3 Forage Crops. (Prerequisites: Agr 1; B 7 and 8). A study of the various types and varieties of grasses and leguminous crops used for hay and pasture. Special attention is given to cultural methods, propagation, and value of the various plants for feed and soil improvement. Two lectures and two laboratory hours.

ASSISTANT PROFESSOR FRIANT *Three credit hours*

Agr 4 Soil Physics. (Prerequisites: C 11, 12, 15; Ps 1, 3). A study of the origin, formation, classification, and function of soils, the relation of soil texture to temperature, air and moisture, and to plant growth; the effect of methods of tillage and drainage on the physical properties of soils. One lecture and four laboratory hours.

ASSISTANT PROFESSOR FRIANT *Three credit hours*

Agr 5 Soil Fertility. (Prerequisites: C 11, 12, 15, 23, 45 and 46; Agr 4). The relation of plant food to the productive capacity of the soil and a study of the methods by which the fertility may be obtained and increased. The ultimate effect of various rotations and of different systems of farming on the fertility of soils. A study of the composition of manures, fertilizers, and amendments, with a comparison of their agricultural and commercial value for different crops. One lecture and four laboratory hours.

PROFESSOR ——— *Three credit hours*

Agr 6 Farm Management. This course is designed to summarize the student's agricultural training and experience and apply it to the efficient management of the farm as a whole. The organization of the farm as a business enterprise, its arrangement with reference to size and shape of field; systems of crop and livestock management; the relation of fixed to circulating capital; the relation of labor to income; farm accounts, etc.

PROFESSOR ——— *Three credit hours*

Agr 7 Farm Equipment. The location, arrangement, design, construction, and cost of farm buildings, especially barns, granaries, silos, etc.; the adaptability, efficiency, construction, operation and durability of field machinery; power machinery, including steam and gasoline engines; the different kinds of fences, cost, construction, and durability; construction of roads, walks, and drains; farm lighting systems, operation, cost, and efficiency; farm water supplies; sewage disposal, etc. One lecture and four laboratory hours.

ASSISTANT PROFESSOR FRIANT *Three credit hours*

Agr 8 Plant Breeding. (Prerequisites: Agr 2, 3, 4, 5; Hort 33). The improvement and breeding of field crops, including the grains, grasses, and legumes; selection; results obtained by various investigators. Lectures, assigned reading, demonstrations, and laboratory work. One lecture and two laboratory hours.

PROFESSOR ——— *Two credit hours*

Agr 9 Advanced Soils. (Prerequisites: C 45, 46; Agr 7 and 5). The determination of the nature and quantity of the elements of fertility; effect upon various crops of different fertilizers added to soils, as determined by pot culture and pot experiments; systematic study of similar work of experiment stations and investigators. Assigned readings, reviews, and laboratory work. One lecture and four laboratory hours.

ASSISTANT PROFESSOR FRIANT *Three credit hours*

Agr 10 Methods of Field Experimentation. (Prerequisites: Agr 2, 3, 4, 5, 8, 9). A course designed for students intending to take up experiment station work. Methods of plotting land for soil and crop experiments; check systems; interpretation of results. The literature of this and other countries pertaining to experimental work will be carefully studied. Two lectures.

PROFESSOR ——— *Two credit hours*

Agr 11 Farm Power. (Prerequisite: Agr 7). A practical course, including the operation, use, and care of gas

and steam engines as a source of farm power, and farm tractors. One lecture and four laboratory hours.

ASSISTANT PROFESSOR FRIANT *Two credit hours*

Agr 12 Land Drainage. (Prerequisites: Agr 4 and 5). A course designed to present the principles of tile drainage, including the laying out, construction, and maintenance of drains. Practice in surveying, mapping, leveling, and the laying of the tile to grade will be given. Four laboratory hours.

ASSISTANT PROFESSOR FRIANT *Two credit hours*

Agr 13 Thesis and Seminar. Original work on an approved subject of investigation.

PROFESSOR ——— *Three credit hours*

Ancient Languages and Literatures

PROFESSOR CONOVER

Throughout the course the aim is to enable the student to acquire facility and quickness in reading at sight and familiarity with the ancient order of thought. Word-meaning is fixed by inspecting form, derivation, and comparison with synonyms. The authors are selected with a view to their representative character. The public and private life of the Greeks and Romans and their influence on modern literature and civilization are continually kept before the minds of the students. English derivatives and words kindred to all Indo-European tongues are frequently noted, and the general principles of comparative philology are explained and applied.

In addition to the department library, which contains the Delphini edition of Latin writers, the Attic orators and dramatists, etc., the department of classical philology in the general library is steadily growing. It contains bound volumes of the American Journal of Philology and of the Harvard Studies in Classical Philology. The American Journal of Philology is kept on file in the reading room.

LATIN

AL 1 and 2 Cicero, De Senectute and De Amicitia. Ovid, Metamorphoses, etc. Prose Composition.

Six credit hours

AL 3 and 4 Livy, 21st or 22d book. Horace, Odes, Epodes, Satires, Epistles. Prose Composition.

Six credit hours

AL 5 and 6 Tacitus, Germania and Agricola. Plautus, Captives and Trinummus. Juvenal, Satires.

Six credit hours

AL 7 and 8 Seneca, Tragedies or Moral Essays. Terence, Adelphoe and Andria. Quintilian, Books X and XII. Lectures on Latin Literature and Inscriptions.

Six credit hours

GREEK

AL 21 and 22 White's First Greek Book. Anabasis, I, II.

Six credit hours

AL 23 and 24 Anabasis III, IV. Homer, Iliad, I-III. Herodotus VII, VIII.

Six credit hours

AL 25 and 26 Lysias, Orations. Plato, Apology and Crito. Aristophanes, Plutus or Clouds.

Six credit hours

AL 27 and 28 Demosthenes, Orations. Lucian, Dialogues. Aeschylus, Prometheus Bound.

Six credit hours

AL 29 and 30 Greek Prose Composition.

Four credit hours

AL 31 and 32 Greek Testament.

Four credit hours

Animal Husbandry

ASSOCIATE PROFESSOR BAKER

The work in Animal Husbandry is designed to familiarize the student with some of the principles underlying this important industry. The class room and laboratory instruction is supplemented by work with the live stock on the College Farm and by visits to the many flocks, herds, and studs of Delaware and Pennsylvania, as well as by attendance at some of the best live stock shows which are held annually within easy reach of the college.

AH 17 Types and Market Classes of Farm Animals. A study of the development of the types of beef cattle, hogs, and sheep, the characteristics of the breeds

within the types, and the relation of market requirements to the live stock industry. Laboratory practice in the judging and selecting of the various classes and simple problems of management will supplement the class room work. Two lectures and two laboratory hours per week. Freshman year.

Three credit hours

AH 18 Types and Market Classes of Farm Animals. (Prerequisite: AH 17). A continuation of AH 17 embodying the study of types, breeds, and market classes of horses and dairy cattle. Two lectures and two laboratory hours per week. Freshman year.

Three credit hours

AH 19 Feeding Farm Animals. (Prerequisites: Chem 11, 12, 15, 21, 23). The fundamental principles of animal nutrition; the composition and qualities of feeding stuffs; the feeding of all classes of farm animals and a general review of experimental work are included. A very fundamental course for successful farm operations. Three lecture hours a week. Sophomore year.

Three credit hours

COURSES REQUIRED OF STUDENTS SPECIALIZING IN ANIMAL HUSBANDRY

AH 22 Advanced Judging. (Prerequisites: AH 17 and 18). The aim of this course is to train students in the selection of desirable sires and breeding females, and for judging at fairs. Men representing the college in judging contests will be chosen from this class. Many excellent stock farms within a radius of fifty miles will be visited. Some lecture work will be given, but the course is made up of four laboratory hours a week. Junior year.

Two credit hours

AH 24 Animal Breeding. (Prerequisites: AH 17, 18; Phys 1, 3; Hort 33; B 1, 2). A series of lectures presenting the newest practical phases of heredity, variation, correlation, prepotency, and their application to breeding of farm animals for production and other purposes. Junior year.

Three credit hours

AH 25 Animal Nutrition. (Prerequisites: AH 17, 18, 19; Chem 11, 12, 15, 23). This course embodies the technical side of animal nutrition, a full study of the chemistry of the feeding problem, the newer aspects of adequate rations, a study of problems in feeding experiments, and other phases concerning the technical side of animal nutrition. Senior year.

One credit hour

AH 27 Seminar. A weekly conference with Senior students in Animal Husbandry, reports and discussion of current literature, activities and experimental work bearing on the live stock business. Senior year.

One credit hour

AH 28 Pedigree Study. (Prerequisites: AH 17, 18, and 21). A series of lectures will be given covering general history of breeding developments, blood lines, methods of breeding types of pedigrees, and all the fundamental questions relating to the determination of animal values based upon their ancestry. Two lectures and two laboratory hours per week. Senior year.

Three credit hours

AH 30 Seminar. Continuation of AH 27. Senior year.

One credit hour

ELECTIVE SUBJECTS

AH 23 Dairy Cattle Management. (Prerequisites: AH 17, 18, and 19). This is a very practical course, including the fundamental principles of dairy farm husbandry. Questions of feeding, breeding, management, sale, advanced registry testing, methods of successful practice, cost of milk production, etc., are carefully considered. Two lectures are given per week, and one two-hour laboratory period, which is used for practical application of principles to different dairy farms. Junior year.

Three credit hours

AH 29 Creamery Work. (Prerequisite: AH 23). This course considers the problems connected with the han-

dling of dairy products, milk, cream, butter, cheese, ice cream, etc. Lectures will be given on methods of testing milk, butter, cheese, etc.; also practice in different phases of creamery operations, and practice work with creamery equipment. Two lectures and two laboratory hours per week. Senior year.

Three credit hours

AH 32 Thesis. Senior year.

Two credit hours

AH 34 Horse, Swine, Sheep and Beef Cattle Problems. (Prerequisites: AH 21, 24). This course will be made up of a series of lectures bearing upon present-day problems in horse, swine, sheep, and beef cattle farming. It is intended for students who plan to begin the operation of a stock farm. The course will be modified somewhat to meet the demands of students enrolled. Senior year.

Four credit hours

Bacteriology, Physiology, and Hygiene

PROFESSOR PALMER

BACTERIOLOGY

Ba 1 and 2 General Bacteriology. A study of the structure, development, distribution, and properties of bacteria and the relation of bacteria to animal and plant life. In the laboratory the student will be instructed in the technique necessary for practical work in bacteriology. Both saprophytic and pathogenic organisms will be studied. It is recommended that students complete the course in general physiology before taking this course. Required of Juniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

Six credit hours

Ba 3 Advanced Bacteriology. (Prerequisite: Ba 1 and 2). A lecture and laboratory course, including an advanced study of the bacteria related to animal life and effects of such organisms upon the body tissues. The course also includes a study of natural and artificial immunity. Elective for Seniors in Agriculture and Arts and Science.

Three credit hours

PHYSIOLOGY

Phy 1 General Physiology. This course includes a study of the structure and functions of animal cells and tissues, followed by a study of the functions of the various organs and systems of the body. Required of Juniors in Animal Husbandry, and elective for Arts and Science students.

Three credit hours

Phy 2 Advanced Physiology. (Prerequisite: Phy 1). This course considers the more highly specialized functions of the body, including glands of internal secretion, special sense organs, and the nervous system. Elective for students in Agriculture and Arts and Science.

Three credit hours

HYGIENE

Hyg 2 Animal Hygiene and Pathology. A study of the methods of preserving the health of farm animals, including the chief sporadic and infectious diseases of live stock, their symptoms, diagnosis, and means of control. It is recommended that students taking this course should have completed the courses in General Physiology and Bacteriology. Required of Juniors in Agriculture.

Three credit hours

Hyg 3 and 4 Hygiene and Sanitation. Instruction in this subject covers the principles of sanitation, the cause, methods of spread and prevention of epidemics, and the various methods of disinfection. Required of Juniors in Civil Engineering and elective for Arts and Science students.

Two credit hours

Biology

PROFESSOR HOUGHTON

The aim of biological instruction is to give the student some knowledge of the various living things by which he is surrounded, as well as to develop habits of careful observation and comparison, and close and accurate methods of thinking. Most of the time is spent in actual study in the laboratory, which is supplied with simple and

compound microscopes, reference works, microtome, reagents, etc. There is also an excellent collection of illustrative specimens and charts.

B 1 and 2 Elementary Zoology. A study of variations in the structure and life history of the different classes of animals, their habits, and relations. The student secures a general knowledge of the principles of classification based upon the evolution of the animal kingdom, and the principles of Zoology. Selected types of the principal groups of animals from Protozoa to Mammalia, of which dissections, drawings, and notes are required, are studied in the laboratory. The course gives a comprehensive view of the science of Zoology to the student taking no further work, and forms a basis for advanced work. One recitation or lecture and four hours of laboratory work a week. Required of Juniors in Agriculture. Elective for Arts and Science students.

Six credit hours

B 3 and 4 Systematic and Economic Zoology. (Prerequisite: B 1 and 2). In this course the student becomes acquainted with a large number of our common vertebrates and learns something of their structure, life histories, habits, and economic importance. Much attention is given to the work of tracing typical specimens, representing as many groups as possible, of Fishes, Batrachians, Reptiles, Birds, and Mammals, by means of keys which are based largely upon structural characters. Thus the student gains a clear idea of the relations of forms and the characters upon which classifications are based. Dissections are made when necessary to understand and use properly the keys. Four hours of laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Four credit hours

B 5 and 6 Economic Entomology. A course treating of the more important injurious insects of orchard, garden, and field crops, also the insect pests of domestic animals and the household. The work deals with their structure, life histories, and descriptions, and the most approved methods for their control. The most important forms are

placed before the class for careful examination and comparison. Special emphasis is laid upon the necessity for the ready determination of species. Two recitations or one recitation and two hours of laboratory work a week. Elective for students in Arts and Science and in Agriculture.

Four credit hours

B 7 and 8 General Botany. As is indicated by its title, this is a general course in botany which aims to give the student a comprehensive idea of the subject as a whole. The topics to which particular attention is given in the first term are as follows: Seeds and seedlings; roots, stems, and leaves; the morphology, evolution, and taxonomy of the Thallophyta, Bryophyta, and Pteridophyta. In the second term the principal topics are as follows: The Gymnospermae; winter buds; the flower and fruit of the higher seed plants; the morphology and taxonomy of the Angiospermae; ecology, and economic botany. One recitation or lecture and four hours of laboratory work a week. Required of Freshmen in Agriculture. Elective for Arts and Science students.

Six credit hours

Chemistry

PROFESSOR PENNY, PROFESSOR THOMPSON, AND PROFESSOR MILLER

Courses are offered in inorganic and organic chemistry, qualitative and quantitative analysis, electrochemistry, physical, industrial and agricultural chemistry. Instruction is given in lectures with experiments and in the laboratory. Courses are adapted to the needs of both general students and special students of chemistry.

C 11 and 12 Inorganic Chemistry. This is an experimental lecture course treating of the elements and their more important compounds. Students in Agriculture and Engineering taking this course are required to take C 15 also.

PROFESSOR PENNY *Four credit hours*

C 15 Qualitative Analysis. This is a laboratory course in elementary qualitative analysis, of six hours in the first term. Students taking C 11 are required to take this course also.

PROFESSOR MILLER *Three credit hours*

C 16 Advanced Qualitative Analysis. (Prerequisites: C 11 and 15). This is a laboratory course supplementary to Course 15; it is intended for students seeking a more thorough knowledge of the subject. Six hours.

PROFESSOR MILLER *Three credit hours*

C 21 and 22 Organic Chemistry. (Prerequisite: C 11 and 12). This is an experimental lecture course treating of the more important carbon compounds.

PROFESSOR PENNY *Six credit hours*

C 23 Quantitative Analysis. (Prerequisites: C 11 and 12, and 15). This is a laboratory course of six hours in elementary quantitative analysis.

PROFESSOR THOMPSON *Three credit hours*

C 24 Advanced Quantitative Analysis. (Prerequisites: C 11 and 12, 15, 16 and 23). This is a laboratory course supplementary to Course 23; it is intended for students seeking greater proficiency in the subject. Six hours.

PROFESSOR THOMPSON *Three credit hours*

C 26 Agricultural Chemistry. (Prerequisites: C 11 and 12, 15, 21, and 23). The chemistry of soils, fertilizers, feeding stuffs, dairy products, insecticides. Lectures, recitations, and laboratory work. Required of students in Agriculture.

PROFESSOR MILLER *Five credit hours*

C 31 and 32 Industrial Chemistry. (Prerequisites: C 11 and 12, and 21 and 22). This is a lecture course treating of the more important industrial processes. Given in 1920-1921, and in alternate years thereafter.

PROFESSOR THOMPSON *Six credit hours*

C 33 and 34 Chemical Calculations. This is a lecture course, with assigned work for students, on the more important mathematical questions arising in chemistry.

PROFESSOR THOMPSON *Four credit hours*

C 35 and 36 Organic Preparations. (Prerequisites: C 11 and 12, 15, 16, 21 and 22, 23 and 24). This is a labora-

tory course; it includes elementary organic analysis and the preparation of some important organic compounds.

PROFESSOR THOMPSON *Six credit hours*

C 37 Gas Analysis. (Prerequisites: C 11 and 12, 21 and 22, 15 and 23). This is a laboratory course in the analysis of flue gases and illuminating gas.

PROFESSOR PENNY *One credit hour*

C 38 Water Analysis. (Prerequisites: C 11 and 12, 15 and 23). This is a laboratory course in the analysis of potable water and of water used for industrial purposes.

PROFESSOR PENNY *One credit hour*

C 41 and 42 Physical Chemistry. This course consists of lectures.

PROFESSOR PENNY *Six credit hours*

C 43 and 44 Electrochemistry. (Prerequisites: EE 9 and 30, and C 11 and 12, and 21 and 22). This is a lecture course treating of theoretical and applied electrochemistry.

PROFESSOR MILLER *Six credit hours*

C 45 and 46 Theoretical Agricultural Chemistry. (Prerequisites: C 11 and 12, and 21 and 22). This is a lecture course treating of the chemistry of plant life, of soils and fertilizers.

PROFESSOR PENNY *Six credit hours*

C 47 and 48 Technical Analysis. ((Prerequisites: C 11 and 12, 15, 23 and 24). This is a laboratory course intended for special students of chemistry. It treats of some important methods of analysis used in applied chemistry.

PROFESSOR THOMPSON *Six credit hours*

C 50 Thesis. Original work on an approved subject in the Senior year.

Civil Engineering

PROFESSOR THOROUGHGOOD, PROFESSOR PRESTON, AND ASSOCIATE PROFESSOR CUMMINGS

CE 1 and 2 Thesis. Each Senior student in Civil Engineering must prepare as a thesis, with such drawings

as are necessary for its proper elucidation, a written description of some structure, machine, or process which he may have examined or designed.

CE 5 Hydromechanics. (Prerequisite: M 11 and 12.) Hydrostatics; flow of water through orifices and tubes; flow in pipes, conduits, and natural channels; hydraulic machinery; pneumatics. Recitations and lectures. Required of Seniors in Civil Engineering.

Four credit hours

CE 7 and 8 Mechanics of Materials. (Prerequisites: M 6, and 11 and 12; Ps 5, 6, 7, and 8; CE 27 and 28). Theory of elasticity; simple stresses; strength of pipes and riveted joints; strength and stiffness of beams and of columns and shafts; resilience of materials. Investigation and design. Properties and structural forms of iron and steel. Recitations, lectures, and laboratory. Required of Seniors in Engineering except those in Chemical Engineering.

Eight credit hours

CE 9 Structures. The design of steel and masonry structures. Lectures and recitations. Required of Seniors in Civil Engineering. Six hours.

Four and a half credit hours

CE 13 and 14 Highways. (Prerequisites: CE 23 and 24). Location, construction, and maintenance of roads, streets, and pavements, including study of tractive forces and of the properties of road materials. Recitations and lectures. Optional with Seniors in Civil Engineering.

Eight credit hours

CE 15 Sewerage. Different systems for the removal of sewage; design, construction, and maintenance of sewers; individual sewers; sewer appurtenances; disposal and utilization of sewage. Recitations, lectures, and visits of inspection. Optional with Seniors in Civil Engineering.

Five credit hours

CE 16 Water Supply. Requisites of a supply; source; construction and maintenance of systems for collecting, storing, purifying, and distributing water. Recitations,

lectures, and visits of inspection. Optional with Seniors in Civil Engineering.

Four credit hours

CE 18 Framed Structures. (Prerequisites: M 6, and 11 and 12; CE 27 and 28). Lectures in the construction of the common type of trusses; stresses in the common forms of roof and bridge trusses by algebraic methods; elementary problems in investigation. Required of Juniors in Civil Engineering.

Three credit hours

CE 21 and 22 Surveying. Study of the compass, transit and level, and their uses and adjustments; use of chain in land surveys; computations in land surveys. Recitations and field work. Required of Freshmen in Engineering except those in Chemical Engineering. Two hours.

Two credit hours

CE 23 and 24 Surveying. (Prerequisite: CE 21 and 22). Principles; problems; use of chain, compass, level, and transit; theory of construction and use of instruments; land surveying with transit; survey of public lands of the United States; topographical surveying; city, hydrographic, and mine surveying; functions of the surveyor; principles for guidance in original surveys and resurveys; adjustment of observations by method of least squares; theory of construction and use of barometer; plotting and computations from students' own field-notes, involving use of various office instruments. Recitations, lectures, field-work, and office-work. Required of Sophomores in Civil Engineering. Four hours.

Six credit hours

CE 25 and 26 Surveying. (Prerequisite: CE 23 and 24). Circular curves; complete topographical survey of a tract of land and location of an industrial spur track; mapping; mathematical astronomy for field use; determination of latitude, azimuth, time, and longitude; use of sextant and solar transit,—day and night observations. Recitations, lec-

tures, field-work, and office-work. Required of Juniors in Civil Engineering.

First term, three and a half credit hours; second term, five and a half credit hours.

CE 27 and 28 Graphic Statics. (Prerequisite: M 16). Coplanar forces, concurrent and non-concurrent; friction; center of gravity; moment of inertia; simple trusses; problems. Recitations, lectures, and drawing. Required of Juniors in Engineering except in Chemical Engineering. Two hours a week.

Two credit hours

CE 29 Engineering Laboratory. Study of construction and use of testing apparatus, including testing machines and attachments, examinations and tests of structural materials; discussion of results; preparation of reports. Required of Seniors in Civil Engineering. Three hours.

One and a half credit hours

CE 30 Structural Design. The detailed design and making of shop drawings for steel structures. Required of Seniors in Civil Engineering.

Two credit hours

CE 32 Hydraulic Design. A course in the drafting-room to accompany CE 16. The design of water-supply and sewage-disposal works. Optional with Seniors in Civil Engineering. Five hours.

Two and a half credit hours

CE 34 Highway Design. A course in the drafting-room and laboratory to accompany CE 14. The design and location of highways. Optional with Seniors in Civil Engineering. Five hours.

Two and a half credit hours

CE 42 Economics. The principles of economics as applied to elementary problems in business and accounting. Recitations and lectures. Required of Seniors in Civil Engineering.

Three credit hours

CE 44 Contracts. Specifications. Business Law. Contracts; specifications; property; negotiable instruments;

agency; partnership; insurance; carriers. Recitations and lectures.

Economics and Business Administration

PROFESSOR HOYT

Bus 1 Elementary Economics. (Prerequisite to all further courses in Business except Bus 3, Bus 4, and Bus 9). The structure and functions of modern industrial society. Individual exchange co-operation, money economy, specialization, machine industry, speculation, the wage system, concentration, competition, and social control.

Three credit hours

Bus 2 Elementary Economics. (Prerequisite to all further courses in Business except Bus 3, Bus 4 and Bus 9). The law of supply and demand, cost of production and utility, laws of rent, wages, profits and interest, tariffs, and taxation.

Three credit hours

Bus 3 Business Law. Law of persons, agency, torts, and contracts. The case book method is used.

Three credit hours

Bus 4 Business Law. Law of real and personal property, sales of merchandise and the law of the market. Should be preceded by Bus 3, but exceptions to this requirement may be made at the option of the instructor.

Three credit hours

Bus 5 Labor. Trade Unions. Development of the trade union, types of trade unions, collective bargaining, union rules, and policies.

Three credit hours

Bus 6 Labor. Labor legislation and immigration. Legislation for shorter hours, minimum wage, old-age pensions, employers' liability, etc. Immigration movement to the United States.

Three credit hours

Bus 7 Finance. Money and Banking. Money as a standard of value and medium of exchange. Bimetalism, paper money, the compensated dollar. Price levels and the high cost of living. Commercial banking. The national banking system and the Federal Reserve system.

Three credit hours

Bus 8 Finance. Business Finance and Public Finance. Financing corporations. Taxation. The relative merits of taxes on land, single tax, excise taxes, inheritance tax, and income tax.

Three credit hours

Bus 9 (10) Accounting. Accounting from the standpoint of the business executive. Principles and practical exercises in the chief forms of accounts.

Three credit hours

Education, Psychology, and Sociology

PROFESSOR WILKINSON

EDUCATION

Ed 3 Principles of Education. This course includes a study of the more important psychological and sociological considerations involved in the problems of educational aims, curriculum making, methods of teaching, and school organization. Readings, reports, and class discussions are used to help the student formulate the principles that should guide educational practice with reference to the foregoing problems.

Three credit hours

Ed 7 High School Aims and Methods. This course is designed to give the student a working knowledge of the aims of secondary education in a democratic society, characteristics of high school pupils, and the principles involved in the selection of subject-matter and methods of teaching high school subjects.

Three credit hours

Ed 8 Educational Administration. A study of some of the more important technical problems of the school

principal, with a view to the discovery and use of standards for determining and promoting the efficiency of the school.

Three credit hours

PSYCHOLOGY

Psy 1 Introduction to Psychology. A study of the fundamental principles of human behavior, including the neural basis, types of action, and the nature and functions of mental processes.

Three credit hours

Psy 2 Applied Psychology. A general survey of the fields in which psychological knowledge has important practical applications. A more careful study is made of those phases which have the most widespread application. Each student is required to make a special study of the field in which he is most interested.

Three credit hours

SOCIOLOGY

Soc 1 Introduction to the Study of Society. This course is designed to acquaint the student with the nature and origin of society and social institutions, the operation of social forces and laws, and the aims and ideals of society, with special reference to a democracy. The course aims to lay a foundation for the scientific study of practical social problems.

Three credit hours

Soc 2 Practical Sociology. A course dealing primarily with social conditions, their causes, significance to society, and possible means of improvement. Among the topics treated the following receive special attention: Family life, immigration, public health, child labor, women in industry, poverty, care of dependents and defectives, crime and punishment, the conservation of natural resources.

Three credit hours

Electrical Engineering

PROFESSOR KEGERREIS AND MR. J. F. THOENE

EE 1 and 2 Direct Currents. Theory of the direct current dynamo; shunt, series, and compound wound field magnets; ring and drum windings; commutators; direct current motors. Operation, regulation, and methods of testing dynamos and motors. Study of motor and dynamo characteristics. Required of Juniors in Mechanical, Electrical, and Chemical Engineering. Three hours a week.

PROFESSOR KEGERREIS *Six credit hours*

EE 3 and 4 Alternating Currents. Inductance and capacity; harmonic electromotive force; single phase and polyphase circuits; alternating current instruments and machinery. Theory of single phase and polyphase induction motors; induction generators; synchronous motors and converters, and single phase commutator motors. Required of Seniors in Mechanical and Electrical Engineering. Three hours a week.

PROFESSOR KEGERREIS *Six credit hours*

EE 6 Wireless Telegraphy and Telephony. A study of modern systems with a review of the historical developments. Required of Seniors in Electrical Engineerin. Two hours a week.

PROFESSOR KEGERREIS *Two credit hours*

EE 7 Electrical Power Plant Engineering. A study of the design and operation of power plants and substations. Two hours per week.

MR. THOENE *Two credit hours*

EE 8 Electric Railways. The construction, equipment, and operation of different types of electric railways. Required of Seniors in Electrical Engineering. Two hours a week.

MR. THOENE *Two credit hours*

EE 11 Direct Currents. Theory and application of electrical machinery. Required of Juniors in Civil Engineering. Two hours a week.

PROFESSOR KEGERREIS AND MR. THOENE *Two credit hours*

EE 31 Electrical Design. The calculation, design, and construction of direct and alternating current machinery. Required of Seniors in Electrical Engineering. Three hours a week.

PROFESSOR KEGERREIS *One and a half credit hours*

EE 41 and 42 Electrical Laboratory. Determination of characteristic curves; efficiencies and magnetic leakage of direct current dynamos and motors; efficiency test of arc and incandescent lamps. Required of Juniors in Chemical, Mechanical, and Electrical Engineering. Three hours a week.

PROFESSOR KEGERREIS AND MR. THOENE *Three credit hours*

EE 43 and 44 Electrical Laboratory. Efficiencies and characteristic curves of alternators, synchronous motors, induction motors, and transformers. Required of Seniors in Electrical Engineering. Six hours a week.

MR. THOENE *Six credit hours*

EE 45 and 46 Electrical Laboratory. Testing of alternating current machinery and apparatus. Required of Seniors in Mechanical Engineering. Three hours a week.

MR. THOENE *Three credit hours*

English

PROFESSOR SYPHERD, PROFESSOR DUTTON, ASSISTANT PROFESSOR MOORE, AND ASSISTANT PROFESSOR FOSTER

The courses in the Department of English are designed (1) to enable every student after graduation to express his ideas, orally or in writing, in accurate, clear, effective English; and (2) to give to students through required and elective work an acquaintance with the best authors in English and American Literature and an appreciation of good poetry and prose. All Freshmen are required to take Composition, which involves training in oral and written expression; all Sophomores, a general course in Litearture, which treats writers, types, and movements. Seniors in Arts and Science and in Engineering are required to take an additional course in English. Elective courses in 1921-1922 will be No. 11, 13 and 14, 15, 16, 19, 28, and 34.

E 1 and 2 Composition. An elementary course which lays especial stress on accuracy and clearness in expression. Recitations, themes, practice in public speak-

ing, conferences, and outside readings. Required of all Freshmen.

PROFESSOR SYPHERD, PROFESSOR DUTTON, ASSISTANT PROFESSOR MOORE, AND ASSISTANT PROFESSOR FOSTER *Six credit hours*

E 3 and 4 Literature. A study of selected English poems, first term; a study of the forms of English prose—drama, essay, novel, and short-story—second term. Lectures, recitations, and reports. Required of all Sophomores in Engineering and Agriculture.

ASSISTANT PROFESSOR FOSTER *Four credit hours*

E 5 and 6 Literature. General Survey. A brief survey of the history of the English language and literature, followed by a more detailed and thorough study of the main literary forms—narrative and lyric poetry, the drama, the novel, and the essay. Discussions, lectures, outside readings, reports, and conferences. Required of Sophomores in Arts and Science.

PROFESSOR DUTTON *Six credit hours*

E 7 and 8 Composition. Technical English for Engineers. In this course, students have practice in public speaking, and in the writing of business letters, reports, instructions, orders, specifications and contracts, and general engineering papers. Required of Seniors in Engineering.

PROFESSOR SYPHERD *Two credit hours*

E 9 and 10 Composition and Literature. A study of the English essay, with exercises in expository writing, first term; a study of the short-story in English, with exercises in narrative writing, second term. Required of Seniors in Arts and Science.

PROFESSOR SYPHERD *Four credit hours*

E 11 Composition. An advanced course in narrative and descriptive writing. Themes, outside reading, and conferences. Elective for Sophomores and Juniors in Arts and Science.

ASSISTANT PROFESSOR MOORE *Three credit hours*

E 13 and 14 Composition. Technical English for Agricultural students. A course in the writing of reports, newspaper articles, and theses, and in the preparation and delivery of speeches and addresses. Elective for Seniors in Agriculture.

PROFESSOR DUTTON *Two credit hours*

E 15 Literature. Victorian Poetry. This course is centered about the poems of Browning, Tennyson, Arnold, and Swinburne. The aim of the course is to obtain a knowledge of the poetry of the period, to study the poems as an expression of the philosophy of life of each of the poets, and to correlate this poetry with the social movements of the time. Elective for Juniors and Seniors. [Omitted in 1920-1921].

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 16 Literature. Nineteenth Century Novel. A study of the main novelists of the century: Scott, Dickens, Thackeray, Eliot, Meredith, and Hardy. Collateral reading in the contemporary novel. Elective for Juniors and Seniors. [Omitted in 1920-1921].

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 17 Literature. Romantic Movement. A study of the social, philosophical, and literary tendencies which are found in the prose and poetry written between 1798 and 1832. Elective for Juniors and Seniors.

ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 19 Literature. Shakspere. The Elizabethan stage; social, political, and literary conditions; a study of selected plays. Elective for Juniors and Seniors. [Omitted in 1920-1921].

ASSISTANT PROFESSOR MOORE *Three credit hours*

E 22 Literature. Modern Drama. Preliminary view of the English drama since Shakspere. Recent and contemporary European drama (Continental plays in translation). Elective for Juniors and Seniors.

ASSISTANT PROFESSOR MOORE *Three credit hours*

E 28 Literature. A literary study of the Bible. Lectures, recitations, and reports. [Omitted in 1920-1921].
PROFESSOR SYPHERD *Three credit hours*

E 32 Literature. Classics in Translation. A study of Greek and Roman classics which have influenced English Literature and English thought. Elective for Juniors and Seniors.
ASSISTANT PROFESSOR FOSTER *Three credit hours*

E 34 Literature. A general survey of the field of American Literature from Franklin to the present time, and an intensive critical study of the most important work of the chief American poets and prose writers. Lectures, recitations, outside reading, and reports. Elective for Sophomores and Juniors. [Omitted in 1920-1921].
PROFESSOR DUTTON *Three credit hours*

E 36 Literature. Chaucer. A critical and appreciative study of some of the Canterbury Tales and of other poems by Chaucer. Elective for Juniors and Seniors.
PROFESSOR SYPHERD *Three credit hours*

E 39 Literature. Emerson. A study of Emerson as poet, essayist, and philosopher. Elective for Juniors and Seniors.
PROFESSOR DUTTON *Three credit hours*

E 42 Public Speaking. A course in the theory and practice of public speaking. Elective for Sophomores, Juniors, and Seniors.
PROFESSOR DUTTON *One credit hour*

History and Political Science

PROFESSOR VAUGHN AND ASSOCIATE PROFESSOR GREENFIELD

The courses in this Department are arranged in the approximate order in which they should be taken by the student. In the first two years certain courses are required; all other courses are elective for properly qualified students. Sophomores may, with permission of the Department, elect courses from 9 to 16 in addition to the required work. Courses 9 to 16 will be given in alternate years. Courses 13, 14, 15 and 16 are omitted in 1920-1921.

H 1 and 2. Modern and Contemporary Europe. An introductory course dealing with the history of Europe from the close of the Napoleonic Wars to the present time, with special emphasis on the period since 1870. Required of Freshmen in Arts and Science.

ASSOCIATE PROFESSOR GREENFIELD *Six credit hours*

H 3 History and Government of Delaware. The aim of this course is to give a general view of the history of Delaware as colony and state and also to outline the main features of its government. Required of Freshmen in Engineering and of Sophomores in Agriculture.

PROFESSOR VAUGHN *One credit hour*

H 5 History of the United States (1763-1848). An advanced course in American history, embracing a study of the Revolutionary period, the formation of the Constitution, foreign relations, early national development, Jacksonian democracy, westward expansion, and the Mexican War. Required of Sophomores in Arts and Science and in Civil Engineering.

PROFESSOR VAUGHN *Three credit hours*

H 6 History of the United States (since 1848). A continuation of H 5 dealing with the slavery controversy, the Civil War, reconstruction problems, material development, and contemporary history and problems. Required of Sophomores in Arts and Science and in Civil Engineering.

PROFESSOR VAUGHN *Three credit hours*

H 9 History of England (to 1688). A general study of the development of the English people—political, social, institutional, and literary—from the earliest times to the Revolution of 1688. Readings and reports. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Three credit hours*

H 10 The British Empire. This course is a continuation of H 9. It embraces a survey of English history since the Revolution of 1688 as a basis for special study of the

expansion of England into Greater Britain and of the problems of the Empire. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Three credit hours*

H 11 Mediaeval Europe. A general survey of European history, institutions, and culture from the downfall of Rome to the close of the Middle Ages. Elective for Juniors and Seniors.

ASSOCIATE PROFESSOR GREENFIELD *Three credit hours*

H 12 The Renaissance and Reformation. The political background of the period is studied but special emphasis is laid on social and economic conditions, the developments in art and literature, and the causes and results of the Protestant revolt. Elective for Juniors and Seniors.

ASSOCIATE PROFESSOR GREENFIELD *Three credit hours*

H 13 The French Revolution and Napoleon. A special study of the Revolutionary era: the characteristics of the Old Regime, the philosophers and economists, the course of the Revolution, the rise of Napoleon, and the wars of the Empire. Elective for Juniors and Seniors.

ASSOCIATE PROFESSOR GREENFIELD *Three credit hours*

H 14 Modern Russia. A history of Russia in the modern period, an appreciation of Russian institutions and culture, and a study of contemporary revolutionary movements. Russia's relation to Near Eastern problems will be emphasized. Elective for Juniors and Seniors.

ASSOCIATE PROFESSOR GREENFIELD *Three credit hours*

H 15 China and Japan. A brief study of the history and problems of the Far East with special reference to China and Japan. Elective for Juniors and Seniors.

ASSOCIATE PROFESSOR GREENFIELD *Three credit hours*

H 16 History of Rome. An advanced course in Roman history for classical students and for those planning to teach history in high schools. Elective for Juniors and Seniors.

ASSOCIATE PROFESSOR GREENFIELD *Three credit hours*

H 21 and 22 American Government. A general course dealing with the organization and activities of our

American government—both national and state. Considerable stress is placed upon practical problems and present-day developments. Required of Seniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

PROFESSOR VAUGHN *Six credit hours*

H 27 and 28 Studies in Delaware History. An advanced course which offers opportunity to develop special topics in the social, economic, and political history of the state. The aim is partly information and partly training in research work. Elective for Juniors and Seniors.

PROFESSOR VAUGHN *Four or six credit hours*

H 29 and 30 Research Course. The student may select his topic for investigation from any of the fields of work outlined above. Elective for Seniors.

PROFESSOR VAUGHN *Six credit hours*

Horticulture

PROFESSOR MCCUE

Courses 16, 17, 18, and 33 are required of all students in Agriculture.

A student specializing in Horticulture will be expected to take nearly all the courses offered by the Department. Students who major in Horticulture are expected to elect courses 5 and 6 in Biology and course 2 in Plant Pathology.

The college is very fortunately located for the study of Horticulture. The fruit and vegetable growing centers of the State are easily accessible. Many famous fruit and truck growing districts in neighboring states are distant but a few hours' ride. The cold storage houses and the large markets of Philadelphia can be reached in an hour's time, and a famous greenhouse district of Pennsylvania lies only a few miles north of Newark. The earnest student will have many opportunities to see the practical growing, harvesting, and marketing of Horticultural crops.

The Experiment Station possesses about forty acres of orchards and gardens that can, to a limited extent, be used for purposes of instruction. All the tree, vine, and bush fruits that can be grown in the State are found in the College Orchards. A small amount of land is also available for the use of students in vegetable gardening. A small greenhouse is available for instructional purposes.

Hort 16 Plant Propagation. (Prerequisite: B 7, 8.) A discussion of the principles governing the propagation of plants by seeds, buds, grafts, layers, and cuttings. Required

of all Freshmen in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 17 Pomology. (Prerequisite: Hort 16.) A general course in fruit growing designed to meet the needs of those students who do not wish a detailed technical course in orcharding. Required of all Sophomores in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 18 Vegetable Gardening. (Prerequisite: Hort 16.) A study of the location of vegetable gardens and truck farms. Soil, cultural, and fertilizer requirements of the principal trucking crops. A study of the construction and management of hot beds and cold frames. Each student is required to plan, plant, and cultivate a small garden. Trips of inspection are required. Required of Sophomores in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 19 Forestry. (Prerequisite: B 7, 8.) A brief introductory course in Forestry. The course embraces a discussion of the handling of wood lots, care and protection of the forests, forest mensuration, and studies of the forest trees of the U. S. Elective for Juniors and Seniors in Agriculture.

PROFESSOR MCCUE *Three credit hours*

Hort 20 Pomology. (Prerequisite: Hort 17.) Commercial Pomology. A course designed to deal with the details of fruit production, both from the practical and scientific standpoints. Special emphasis is placed upon spraying. Elective for Juniors in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 21 or 22 Landscape Gardening. (Prerequisites: B 7, 8; Hort 16.) This course gives a discussion of the laws of ornamental gardening, planning and making lawns, grouping of trees and shrubbery, and the comparisons between the formal and naturalistic styles of gardening.

Elective for Juniors and Seniors in Agriculture. First or second term. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 23 Advanced Pomology. (Prerequisites: B 7, 8; Hort 16, 17, and 20.) A continuation of course 20. Elective for Seniors in Agriculture. Two recitations and two laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 24 Breeding of Horticultural Plants. (Prerequisites: Hort 16, 17, 18, 20, and 33.) A study of the application of the laws of heredity to economic horticulture. Elective for Seniors in Agriculture.

PROFESSOR MCCUE *Three credit hours*

Hort 25 or 26 Small Fruits. (Prerequisites: Hort 16 and 19.) A discussion of the commercial production of strawberries, raspberries, gooseberries, and currants. Elective for Juniors and Seniors in Agriculture. First or second term.

PROFESSOR MCCUE *Three credit hours*

Hort 28 Forcing Crops. (Prerequisites: Hort 16 and 18; B 5, 6, 7, 8, and Pl Path 2.) A study of greenhouse crops, both vegetable and floral, and greenhouse construction. Elective for Seniors in Agriculture. Two recitations and four laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 29 Systematic Pomology. (Prerequisites: Hort 17 and 20.) A study of the systematic relationship of the cultivated fruits of the United States. Identification, description, and judging of the common commercial varieties of apples, pears, plums, grapes, and peaches grown in America. Elective for Seniors in Agriculture. One recitation and four laboratory hours.

PROFESSOR MCCUE *Three credit hours*

Hort 31 and 32 Horticultural Seminar. A study of the literature of horticulture, both past and present, and current events of horticultural interest. Required of all Senior students majoring in Horticulture.

PROFESSOR MCCUE *Two credit hours*

Hort 33 Genetics. (Prerequisite: B 7, 8.) A brief course discussing the foundation principles and the various theories of heredity. Required of Seniors in Agriculture and elective for Juniors and Seniors in Arts and Science.

PROFESSOR MCCUE *Three credit hours*

Mathematics

PROFESSOR HARTER, PROFESSOR THOROUGHGOOD, PROFESSOR PRESTON, ASSOCIATE PROFESSOR CUMMINGS

M 3. College Algebra, including a review of the elements. Required of Freshmen in Arts and Science.

Four credit hours

M 4. Plane and Spherical Trigonometry. Required of Freshmen in Arts and Science.

Four credit hours

M 5. Analytic Geometry. Required of Sophomores in Engineering.

Six credit hours

M 6. Differential and Integral calculus. Required of Sophomores in Engineering.

Six credit hours

M 9 and 10. General Astronomy.

Six credit hours

M 11 and 12. Theoretical Mechanics.

Twelve credit hours

M 13. Method of least squares. The theory of Errors of Observations.

Two credit hours

M 15. Plane Trigonometry and elements of Algebra and Engineering Computations. Required of Freshmen in Engineering.

Four credit hours

M 16. Spherical Trigonometry, and Advanced Algebra, and Engineering Computations. Required of Freshman Engineers. Recitation—four hours a week, and Mathematics Laboratory—three hours a week.

Five and a half credit hours

M 20. The Theory of Functions.

Two credit hours

M 21. Analytic Geometry. An elective study for students in Arts and Science.

Three credit hours

M 22. Calculus. An elective study for students in Arts and Science.

Three credit hours

Mechanical Engineering

PROFESSOR M. VAN G. SMITH, MR. COYLE, MR. L. BLUMBERG, MR. J. F. THOENE AND MR. FRED A. THOENE

ME 1 Elements of Steam Engineering. A general description of engines and boilers; their fundamental principles; detailed description of their parts; the reasons for using various elements of construction; practice in the use of an engineering vocabulary; free-hand sketches of various parts of engines and boilers. Required of all Juniors in Engineering. Three hours a week.

Three credit hours

ME 2 The Steam Engine. Elementary principles of the steam engine; parts of the steam engine; the slide value; value setting; action of steam in the cylinder; the steam engine indicator and reducing motions; indicated and brake horsepower. Required of all Juniors in Engineering. Three hours a week.

Three credit hours

ME 3 and 4 Thermodynamics. (Prerequisites: M11 and 12.) The fundamental laws of the mechanical theory of heat, and their application to gases, saturated and superheated vapors; the theory of steam, air and gas engines, and refrigeration machines. Required of Seniors in Mechanical and Chemical Engineering. Two hours a week.

PROFESSOR SMITH *Four credit hours*

ME 5 and 6 Steam Engines and Boilers. (Prerequisites: ME 1 and 2.) The principles, theory, and construction of the steam engine. The fundamental principles

of steam turbines. Power plant auxiliaries. Steam boilers; their principles, design, and construction. Required of Seniors in Mechanical and Electrical Engineering. Four hours a week.

PROFESSOR SMITH *Eight credit hours*

ME 7 Gas Engines. The theory and principles of the gas engine; its construction and operation; gas producers. Required of Seniors in Mechanical and Electrical Engineering. Two hours a week.

PROFESSOR SMITH *Two credit hours*

ME 8 Steam Turbines. Their theory and construction. A continuation of course ME 6. Required of Seniors in Mechanical Engineering. Two hours a week.

PROFESSOR SMITH *Two credit hours*

ME 21 and 22 Mechanical Drawing and Descriptive Geometry. The care and use of instruments and materials; outlining; principles of outline shading; section lining; lettering; projections. The solution of problems relating to points, lines, planes, and surfaces, with practical applications. Recitations and drawing-room work. Required of all Freshmen in Engineering. Five hours a week.

MR. BLUMBERG AND MR. F. A. THOENE *Seven credit hours*

ME 25 and 26 Mechanical Drawing. The intersection and development of surfaces; free-hand sketching; detailed working drawings and assembly drawings; tracing; blue printing; drawing from empirical formulas; use of handbooks. Required of Sophomores in Mechanical and Electrical Engineering. Six hours a week.

MR. BLUMBERG AND MR. F. A. THOENE *Six credit hours*

ME 29 and 30 Kinematics. The laws of motion; combinations of pure mechanism; rolling and sliding contact; velocity diagrams; linkwork; cams; pulleys; forms of gear teeth. The general theory of slide value and link motions. The application of the Zeuner diagram to the design of the principal slide-value gears. Required of Juniors in Mechanical and Electrical Engineering. Three hours' recitation and two hours' drafting a week.

MR. J. F. THOENE *Six credit hours*

ME 31 and 32 Machine Design. The principles of the design of machinery; their application to the design of special parts, comprising the calculation of all stresses and the necessary distribution of metal to withstand the stresses; properties and uses of materials; the use of handbooks. Classroom work, lectures, and drafting. Required of Seniors in Mechanical Engineering. Six hours a week.

MR. J. F. THOENE *Six credit hours*

ME 33 and 34 Mechanical Drawing. A course similar to ME 25 and 26. Required of Sophomores in Civil and Chemical Engineering. Three hours a week.

MR. BLUMBERG AND MR. F. A. THOENE *Three credit hours*

ME 35 and 36 Machine Drawing and Design. The design of machine parts by the aid of formulas and handbooks; the combination of machine parts with reference to their kinematical relations; methods of laying out cams, gear wheels, and other mechanical contrivances; lay-outs for mechanical and electrical machinery. Required of Juniors in Mechanical and Eletrical Engineering. Three hours a week.

MR. BLUMBERG *Three credit hours*

ME 41 and 42 Experimental Engineering. Tests of engines, boilers, steam turbines, steam pumps, blowers, air compressors, gas engines, and condensers; hydraulic measurements; calorific values of fuels; calculations and reports. Required of Seniors in Mechanical Engineering. Six hours a week.

PROFESSOR SMITH *Six credit hours*

ME 43 and 44 Experimental Engineering. A course similar to ME 41 and 42. Required of Seniors in Electrical Engineering. Three hours a week.

PROFESSOR SMITH *Three credit hours*

ME 46 Experimental Engineering. A course similar to ME 48. Required of Seniors in Civil and Chemical Engineering. Six hours a week.

Three credit hours

ME 48 Experimental Engineering. The apparatus used to measure power; methods of measuring power; calibration of instruments; adjustment of valves and other parts of engines; brake and dynamometer tests; the mechanical efficiency of prime movers; calculations and reports. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

One and a half credit hours

ME 51 and 52 Pattern Making. The care and general use of wood-working tools; the principles of pattern making; patterns for machine parts; core boxes; core making; dry sand moulding. Required of Freshmen in Mechanical and Electrical Engineering. Three hours a week.

MR. COYLE AND ——— *Two credit hours*

ME 53 and 54 Machine Work. Exercises in metal turning, facing, boring, planing, drilling, thread cutting, and milling; the use of metal-working hand tools, chipping, and filing. Required of Sophomores in Mechanical and Electrical Engineering. Three hours a week.

MR. COYLE AND ——— *Two credit hours*

ME 55 and 56 Metal Work and Forging. The construction of machine parts, finishing, and assembling; forging, tool dressing, and tempering. Required of Juniors in Mechanical and Electrical Engineering. Three hours a week.

MR. COYLE AND ——— *Two credit hours*

ME 57 and 58 Machine Work. A course similar to ME 53 and 54. Required of Freshmen in Civil and Chemical Engineering. Three hours a week.

MR. COYLE AND ——— *Two credit hours*

ME 59 Machine Work. A course similar to ME 55. Required of Sophomores in Chemical Engineering. Three hours a week.

MR. COYLE AND ——— *One credit hour*

Military Science and Tactics

CAPTAIN CARLETON COULTER, JR., *Infantry, U. S. A.*

The Reserve Officers' Training Corps Unit (infantry) at this

Institution is for the purpose of qualifying students to be company officers of infantry.

The advanced course is elective and for Juniors and Seniors only.

Students must have two years' military training to be eligible to take the advanced course and must sign a contract with the Government to continue the course for two years unless sooner graduated or dismissed from the college.

The Government agrees to pay each student in the advanced course $.40 a day or $2.80 a week for the entire academic year.

The Government also agrees to furnish every member of the R. O. T. C. unit with a complete uniform of olive drab, woolen shirt, shoes, hat, and leggings.

Basic Course

FRESHMAN YEAR

Mil 1 and 2 Three hours a week.

Three credit hours

SOPHOMORE YEAR

Mil 3 and 4 Three hours a week.

Three credit hours

JUNIOR YEAR

Mil 5 and 6 Three hours a week.

Three credit hours

SENIOR YEAR

Mil 7 and 8 Three hours a week.

Three credit hours

Advanced Course

JUNIOR YEAR

Mil 9 and 10 Five hours a week.

Five credit hours

SENIOR YEAR

Mil 11 and 12 Five hours a week.

Five credit hours

Mineralogy and Geology

PROFESSOR PENNY AND PROFESSOR MILLER

Mineralogy is taught by means of recitations and lectures, followed by laboratory work on the determination of the different species of minerals. The course is three hours for one term.

Geology is taught by means of recitations and lectures. The course is three hours for one term.

Mi 31 Mineralogy. This course treats of the physical, morphological, and chemical properties of minerals and especially of the occurrence and recovery of the useful minerals. Recitations and laboratory practice.

PROFESSOR MILLER *Three credit hours*

Mi 32 Geology. This course treats of dynamical, structural, and historical geology. Recitations and lectures.

PROFESSOR PENNY *Three credit hours*

Modern Languages and Literatures

PROFESSOR E. L. SMITH, ASSISTANT PROFESSOR SALESKI, ASSISTANT PROFESSOR BRINTON AND ASSISTANT PROFESSOR KIRKBRIDE

French and German are among the required subjects of study, and Spanish and Italian are offered to those who wish to elect them. With the approval of the Faculty any year or years of this work may be elected by a student in addition to the amount required in his course.

The aim of the courses offered in Modern Languages is to provide elementary and intermediate instruction in German, French, Spanish, and Italian. Students who have completed commendably the courses offered in these languages may expect to possess a good pronunciation, an accurate reading knowledge of the language, and an acquaintance with the more important modern authors and some familiarity with the more important literary groups and movements. The scientific and commercial aspects of the languages receive due attention but without overlooking the more important cultural values. An effort is made to acquaint the student with the several European civilizations from the linguistic and literary point of view, and to inspire in him such a love for these languages and literatures as will be a source of pleasure and intellectual growth.

FRENCH

ML 1 and 2 French Elements. Stress is laid on accurate pronunciation. Practice in the use of phonetic symbols. The essentials of grammar, including the irregular verbs. Reading of easy modern French prose. Oral and

written exercises. Dictation. Aldrich and Foster, French Grammar. Aldrich and Foster, French Reader. Labiche et Martin, Le Voyage de Monsieur Perrichon.

Six credit hours

ML 3 and 4 Intermediate French. This course is designed to meet the requirements of students who offer from one to two years of French for entrance credit. A rapid but thorough review of French grammar. French composition is continued throughout the course by means of themes, reports, letter-writing, etc. Aural and phonetic training. After the grammar review has been completed, one period a week is devoted to the rapid reading of French texts, newspapers, etc., which are used as a basis for vocabulary building. Prerequisite: Two years' high school French or ML 1 and 2.

Six credit hours

ML 5 and 6 Advanced French. Course in French civilization, preliminary to study of French literature. Study of France and the French. French institutions, geography, history and character of the people. Outline of history of literature with illustrative reading. Continuation of work in French composition based on material of the course—assigned themes, reports, etc. Aural training and definite emancipation from dictionary are two primary aims of this course. Prerequisite: ML 3 and 4, or their equivalent.

Six credit hours

ML 7 and 8 General Survey of French Literature. A general survey of French literary activity from 1600 to 1850. Some careful reading and translation from representative literary masterpieces in class. Lectures, collateral reading, and reports.

Six credit hours

ML 9 and 10 Nineteenth Century. Philosophy, history, criticism, drama, fiction, and poetry. Chateaubriand, Mme. de Staël, Hugo, Sainte-Beuve, Thierry, Merimée, Balzac, Lamartine, Beranger, Musset, Dumas père, Dumas fils, Scribe, Michelet, Thiers, Gautier, Sand, Renan, Taine, Augier, Sardou, Brunetière, Lemaitre, Faguet, Daudet, Zola,

Maupassant, France, Loti, Coppée, de Vigny, Rostand. Lectures, collateral reading, and reports.

Six credit hours

SPANISH

ML 21 and 22 Elementary Spanish. Stress is laid on accurate pronunciation, mastery of elements of grammar, and the acquisition of vocabulary. Oral and written exercises. Reading of easy modern Spanish prose. Composition and conversation. Hills and Ford, Spanish Grammar. DeVitis, Spanish Reader. Crawford, Spanish Composition. Gil Blas.

Six credit hours

ML 23 and 24 Advanced Spanish. Attention will be given to both practical and literary ends. Conversation and composition in Spanish throughout the year. Humphrey's Spanish Prose Composition. During the first half of the year representative plays and novels from the nineteenth century will be read and studied. During the second half either Cervantes' Don Quixote or the dramas of Lope de Vega and Calderon will be studied. Lectures, readings, and reports.

Six credit hours

ITALIAN

ML 41 and 42 Elementary Italian. Study of Italian grammar with oral exercises in elementary composition. Grandgent, Italian Grammar. Easy reading in modern Italian.

Six credit hours

ML 43 and 44 Advanced Italian. Reading of more difficult Italian prose. Dante, La Divina Commedia.

Six credit hours

GERMAN

ML 61 and 62 Beginners' German Course. Grammar, reading, composition, conversation. No credit will be given for less than the full course.

Six credit hours

ML 63 and 64 First Year College German. For those who have completed two years of high school German or ML 61 and 62. Grammar, reading, composition, conversation. Thomas, Practical German Grammar; Thomas and Hervey, German Reader; Baumbach, Die Nonna; Freytag, Die Journalisten; Heyse, Das Maedchen von Treppi. No credit will be given for less than the full course.

Six credit hours

ML 65 and 66 Second Year College German. ML 65 is prerequisite to all the German courses following. Reading, composition, conversation. Credit will be given for either half only by special arrangement.

Six credit hours

ML 71 and 73 Goethe. (Prerequisite: ML 65.) Conducted mainly in German. [In 1920-1921 both ML 71 and 73 will be omitted; in 1921-1922 ML 73 and in 1922-1923 ML 71 will be omitted.]

Each, Three credit hours

ML 72 Lessing. (Prerequisite: ML 65.) [Omitted in 1921-1922 and 1922-1923.]

Three credit hours

ML 74 Schiller. (Prerequsite: ML 65.) Conducted mainly in German. [Omitted in 1920-1921 and 1921-1922.]

Three credit hours

ML 76 The German Drama since Goethe. (Prerequisite: ML 65.) Conducted mainly in German. [Omitted in 1920-1921 and 1922-1923.]

Three credit hours

ML 78 German Prose since Goethe. (Prerequisite: ML 65.) Conducted mainly in German. [Omitted in 1920-1921 and 1921-1922.]

Three credit hours

ML 80 German Lyric Poetry since Goethe. (Prerequisite: ML 65.) Conducted mainly in German. [Omitted in 1920-1921 and 1922-1923.]

Three credit hours

ML 81 Middle High German. (Prerequisite: ML 65.) Conducted mainly in German. [Omitted in 1921-1922 and 1922-1923.]

Three credit hours

ML 82 Advanced Scientific German. (Prerequisite: ML 65.) [Omitted in 1921-1922 and 1922-1923.]

Three credit hours

Physics

PROFESSOR HARTER AND PROFESSOR HANCOCK

Ps 1 Mechanics, Heat and Sound. The fundamental principles of these subjects are studied chiefly from the experimental standpoint. Lectures and recitations. Three hours per week. Required of Sophomores in Agriculture and elective for all students in Arts and Science.

Three credit hours

Ps 2 Light, Electricity and Magnetism. A continuation of Ps. 1.

Three credit hours

Ps 3 Physical Laboratory. Introduction to instruments and methods used in the Physical Laboratory. Experiments in Mechanics and Heat. Given in connection with Ps. 1. One three-hour exercise per week.

One and a half credit hours

Ps 4 Physical Laboratory Experiments in Sound, Light and Electricity. Given in connection with Ps 2. One three-hour exercise per week.

One and a half credit hours

Ps 5 and Ps 6 General Physics. A thorough course in the fundamentals of physics, including the solution of problems. Lectures and recitations. Five hours per week. For Sophomores in Engineering.

Ten credit hours

Ps 7 and Ps 8 Physical Laboratory. An introduction to methods and instruments used in Physical Laboratory. Experiments in Mechanics, Heat, Electricity, Sound, and

Light. Given in connection with Ps 5 and Ps 6. One three-hour exercise per week.

Three credit hours

Ps 10 Advanced Physics. A second course in Physics offered to properly qualified students in any department or year. Lectures, recitations, and laboratory work.

Three and a half credit hours

Plant Pathology

ASSOCIATE PROFESSOR LECATO

Pl Path 2 Plant Pathology. (Prerequisites: B 7 and 8; Ba 1 and 2.) An elementary course covering the principal bacterial and fungous diseases of the more important economic plants, with special emphasis on orchard and trucking diseases. Students will be expected to learn to recognize the more important diseases and to prescribe treatment. Some attention will be given to isolating and culturing parasitic bacteria and fungi. Frequent trips will be made to study diseases under field conditions. Each student will be required to make a collection of 25 diseased specimens.

Elective for students in Arts and Science and required of Juniors in Agriculture. One hour lecture and four hours' laboratory.

Three credit hours

Soil Bacteriology

PROFESSOR MANNS

SB 2 Soil Bacteriology. (Prerequisites: Bacteriology 1, 2; Chemistry 45, 46.) The course covers a study of the economic importance of the invisible but highly active soil organisms. These organisms, the bacteria, fungi, and protozoa, have been shown in recent years to play an active part in soil fertility. A study will be made of their work in relation to ammonification, nitrification, and denitrification; the influence of cropping and tillage on the flora; the economic use of fertilizers and lime; bacteria in relation to the fixation of nitrogen by legumes.

The laboratory work will consist of a quantitative and qualitative study of the types of flora, i. e., the ammonifiers, nitrifiers, nodule organisms, and some parasitic fungi from sick soils; measuring the rate of nitrification, fixation of atmospheric nitrogen, and ammonification in different soils variously manured, fertilized, and limed.

Elective for Seniors in Arts and Science and required of Seniors in Agriculture. One hour lecture and four hours' laboratory. Second term.

Three credit hours

Vocational Agricultural Education

PROFESSOR HEIM

The courses in this department are arranged in accordance with the State and Federal Plans for vocational education. Students completing the courses are entitled to be certificated for teaching vocational agriculture in any secondary school.

The classroom and laboratory instruction is supplemented by observation and practice teaching in state and federally aided approved schools of the state. Several visits to vocational schools of adjoining states will also be required during the Senior year.

A student preparing for vocational teaching will be required to take all the courses offered by this department and have at least two years of practical farm experience.

VAE 1 (2) History of Vocational Education. (Prerequisite: Ed 3 and Psy 1.) This course is designed to give prospective high school teachers of vocational agriculture something of the history, development, and present status of the American school system, with special emphasis on the secondary school, its relation to other schools in our educational system, and the history, aims, and principles of vocational education. Junior year.

Two credit hours

VAE 4 Organization and Administration of Agri. Educ. (Prerequisite: VAE 1 (2).) This course offers a detailed study of (1) the organization and administration of state and federal laws dealing with agricultural education for schools of less than college grade; and (2) the history, aims, and principles of agricultural education. Throughout

the course the vocational aspects of secondary education will be emphasized. Junior year.

Two credit hours

VAE 5 (6) Teaching Vocational Agriculture. Special Methods. (Prerequisites: VAE 1 and 4.) The application of the principles of education to the problems of vocational teaching and practice. Among the topics considered are a study of the purposes of vocational agriculture, organization and presentation of subject matter, textbook preparation of lesson plans, home projects and community activities of the school and teacher. Two hours' lecture and two hours' laboratory. Senior year.

Three credit hours

VAE 8 Observation and Practice Teaching. (Prerequisites: VAE 1 (2); 4 and 5 (6). The object of this course is to give students a concrete knowledge of the best educational practices with respect to methods of teaching vocational agriculture and to offer opportunity to put those methods into practice in the schoolroom. Methods studied in course 3 are put into actual practice in an approved high school department of agriculture. A minimum of five hours of teaching and observation is required of all students for certification.

Two credit hours

VAE 9 and 10 In order to keep abreast of the times, a weekly conference will be held to study the present-day literature dealing with vocational education and current events of vocational interest. Required of all Seniors majoring in agricultural education.

One credit hour

GENERAL INFORMATION

Expenses

TUITION

Tuition is free to students from the State of Delaware. The tuition for all other students is $25 a term or $50 for the year.

FEES

	First Term	*Second Term*
INCIDENTAL EXPENSES	20.00	20.00
Use of Library		
Use of Gymnasium		
Ordinary "wear and tear"		
Student Athletics	7.50	7.50
LABORATORY		
Shop—		
Freshman year	5.00	5.00
Sophomore year	6.00	6.00
Junior year	5.00	5.00
Electrical Engineering—		
Junior year	7.50	7.50
Senior year	7.50	7.50
Mechanical Engineering—		
Junior year Mechanical	1.50	1.50
Junior year Electrical	1.50	1.50
Senior year Mechanical	3.00	3.00
Senior year Electrical	1.50	1.50
Senior year Civil	1.50	1.50
Chemistry	10.00	10.00
Zoology	2.50	2.50
Botany	2.50	2.50
Soil Bacteriology		2.50
Plant Pathology		2.50
Agronomy 1,2,3,8 each		2.50
Agronomy 4,5 each		3.00
Horticulture 16,18 each		1.50
Bacteriology	4.00	4.00

Matriculation

A fee of $5.00 is charged to each student on entering college. This fee is collected but once.

Registration

Students who register on or after the fourth day of the beginning of the term will be required to pay an extra charge of $2.50.

ROOMS AND BOARD

Rooms. Rooms may be obtained in the new Dormitory, Harter Hall, as follows:

Single room	$75.00 to $85.00	each student
Double room	45.00 to 47.50	" "
Suite for two with study room	90.00 to 100.00	" "
Suite for three	70.00	" "

Rooms in Harter Hall are of three classes—single, double, and en suite. The College provides for each student a bed, chiffonier, study table, and two chairs. Other furnishings, including bed clothes and linen, must be provided by the student. All rooms are heated with steam and lighted with electricity.

Applications for rooms for 1920-1921 should be made to Mr. A. G. Wilkinson, Business Administrator. Rooms must be engaged for the entire year. A deposit of $5.00 must be made when a room is rented. It is recommended that rooms be engaged not later than the month of June.

Board. ALL RESIDENT STUDENTS, EXCEPT THOSE WHO LIVE IN THEIR OWN HOMES, ARE REQUIRED TO BOARD IN THE COLLEGE DINING HALL. Board in Old College, specially equipped with all comforts, including Lounge and Club rooms, costs $6.25 per week, with Dining Room Service. The Commons is being run on a cost basis, and any material reduction in the cost of food will therefore mean an immediate reduction in price.

Military Department. A DEPOSIT OF TEN DOLLARS (PAYABLE AT THE OPENING OF THE SESSION) IS REQUIRED OF EVERY STUDENT FOR THE RETURN OF THE MILITARY SUIT AND EQUIPMENT ISSUED TO HIM BY THE UNITED STATES GOVERNMENT.

ESTIMATED TOTAL EXPENSES

The usual expenses for the year of a Freshman from the State of Delaware who boards in Newark may be estimated approximately as follows:

Matriculation	$5.00
Incidental expenses	55.00
Board, 36 weeks at $6.25 per week	225.00
Room (average rental)	60.00
Books	12.00
Laundry	18.00
Other incidentals (personal expenses)	25.00
Total	$400.00

For a student in Agriculture, $5.00 should be added for charges in Botanical Laboratory. For a student in Engineering, approximately $25 should be added for draughting instruments and Shop charges. Each student in the Military Department pays $12 for his uniform. For a student coming from another state, $50 should be added for Tuition. Additional laboratory fees are as follows: Agronomy, 1, 2, 3, and 8, $2.50 each; Agronomy,4 and 5, $3.00 each, with a deposit of $5.00 for breakage; Plant Pathology, $2.50; Soil Bacteriology, $2.50.

Juniors and Seniors in the Reserve Officers Training Corps receive forty cents a day for subsistence.

PAYMENTS

The matriculation fee of $5.00 must be paid at the time of registration.

The college bill for the first term is due and payable at the opening of the college year; the bill for the second term, at the opening of the second term. In order to be

admitted to classes and laboratories, students must present to the Instructors in charge the Treasurer's receipt for the payment of the fixed charges of the college.

Bills for board are due and payable as follows: One-half of the first term bill at entrance and one-half before November 1; one-half of the second term bill at the opening of the second term and one-half before March 15. No refund will be made unless a student is obliged to leave college during the term.

Room rent for the entire year is payable at the opening of the college year.

Registration. Application for admission to college should be made to the Dean of the College before Tuesday, September 14, 1920. Candidates for admission to the Freshman class are advised to submit their applications and credentials at the time of the Entrance Examinations in June or during the summer preceding the college year in which they wish to enter. Sophomores, Juniors, and Seniors should register on or before Thursday, September 16, 1920.

Advisers. An adviser for each ten members of the Freshman Class is appointed by the President at the beginning of each academic year. The advisers for the other classes are appointed by the President at the close of each academic year from a list of men chosen by the respective classes.

Attendance. Regular attendance is required at all college exercises. Suitable rules governing absences have been adopted and any student not observing them will be dropped from the college. Punctual return to the college after vacation or at the beginning of a term is insisted upon. All absences immediately preceding or following a vacation are counted double.

All work missed by reason of necessary absences must be made up to the satisfaction of the professor concerned; otherwise the student will be marked zero for each exercise missed. The privilege of making up work will not be granted after an unexcused absence.

Religious Instruction. The college is in no sense sectarian, but every student is expected to attend public worship at least once each Sunday at such place as parent or guardian may select.

Infirmary. To aid in caring for the health of the students, the college has established an Infirmary. In the building are four rooms for ordinary cases, two rooms for contagious diseases, and an office for first aid. The work of the infirmary is in charge of Miss Rosalie Pié, a trained nurse.

Examinations. Examinations in all subjects are held at the close of each term and are conducted either in writing, or orally, as the nature of the subject may require or as the professor may prefer. Review examinations are also held at other times whenever, in the judgment of the professor, the objects of instruction may be promoted by such means. The examinations are designed not as a mere test of the student's knowledge, but as a valuable training in rapid, concise, and accurate expression. They serve as a valuable means of giving the student a ready command of his mental powers, and, by encouraging a review of a period of work, they give him a broader view and a firmer hold of the several subjects of study.

The Honor System was adopted by the student body in 1916.

In determining a student's fitness to proceed to a higher class, great weight is given to the character of his performance of recitation room duties. The results of the term examinations are combined with the recitation records; but in fixing the student's standing the quality of his recitation work is the weightier factor.

No student will be promoted unless he has completed three-fourths of the work of his class of the year just passed and has no condition in previous years unsatisfied.

Re-examinations. Students who fail in an examination in any subject are required to pay a fee of one dollar for a re-examination. In order to be admitted to a re-examination students must present to the examiner a certificate properly signed showing that the fee has been paid.

Elective Studies. Students in Arts and Science must submit to the Dean, on or before May 15 of each academic year, schedules showing elective courses for the following year.

Reports. At the close of each term a report of the student's general combined recitation and examination record will be sent to his parents or guardian. These reports show the course of study the student is pursuing and the class in which he is enrolled. Parents are urged to give these reports close attention, and, when the reports indicate any lack of attention to duty, to co-operate with the Faculty in correcting habits of idleness and indifference.

Students' Self-Aid. A committee of members of the Faculty helps to secure employment for students who depend on their own resources. All students wishing to avail themselves of opportunities thus offered are required to register with the chairman of the committee, Professor G. E. Hancock.

Prizes and Scholarships

The Bishop Coleman Memorial Prize

The Bishop Coleman Memorial Prize of twenty-five dollars is offered annually to the member of the graduating class having in all respects the best standing in the Senior year.

The Alumni Prize

A silver cup is offered by the Alumni Association to be competed for in an Annual Debate between teams representing the Freshman and Sophomore classes. This cup will become the property of the class which wins two debates.

Lieutenant Clarke Churchman Memorial Prize

The Delaware Daughters of the American Revolution and friends of Lieutenant Clarke Churchman have established a "Lieutenant Clarke Churchman Memorial Fund,"

the income from which is to be used for the encouragement of military virtues and instruction by the annual presentation of a premium to the student who shall attain the highest proficiency in the military department. The prize derived from this fund amounts annually to twenty-five or thirty dollars.

The Philo Sherman Bennett Prize

The Hon. William Jennings Bryan, in carrying out the will of Philo Sherman Bennett, Esq., late of New Haven, Connecticut, has designated Delaware College as one of the twenty-five colleges or universities to receive its share of an endowment of ten thousand dollars to be invested and the proceeds to be applied to the payment of an annual prize "for the best essay discussing the principles of free government." Delaware College has accordingly received four hundred dollars in trust for this purpose, and from the income derived from this sum an annual prize will be awarded to the undergraduate student who presents the best essay in the fields prescribed. The income from this fund yields an annual prize of twenty to twenty-five dollars.

The William D. Clark Prize for Mathematics

The late Miss Julia Newton Clark, in memory of her father, William D. Clark, offered a prize of twenty-five dollars to be awarded at the end of the Sophomore year to the student who had shown the greatest proficiency in Mathematics during his Freshman and Sophomore years. Since her death this prize has been given by Miss Emma Clark.

The State Grange Prizes

For the purpose of encouraging a high standard of work in the Agricultural courses, the Delaware State Grange has offered three cash prizes of fifteen dollars, ten dollars, and five dollars in gold to be awarded respectively to the three students pursuing the course in Agriculture who have manifested the greatest interest, and made the

greatest progress in their work during the year for which the prizes are awarded.

Old Home Prize *(William H. Purnell Memorial)*

This prize was established by persons interested in the life, history, and biography of the Delmarvia peninsula, and made a memorial to President Purnell. The annual income from a fund of $500 is available for this prize, to be awarded for the best essay on some phase of the history of Delaware or the "Eastern Shore." It is open to all students. Successful essays will be read by title on Commencement Day and will be bound and filed in the College Library. Essays of sufficient merit may be published. Rules for the guidance of contestants will be posted.

Edward Reynolds Memorial

Three prizes of $25, $15, and $10 respectively are offered by Mrs. E. W. Reynolds to the students in chemistry who submit the best essays on chemical subjects. Seniors, Juniors, and Sophomores may compete for these prizes.

Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware

A scholarship amounting to $100 annually was founded in 1914 by the Harvard, Princeton, and Yale Clubs of Delaware. It will be awarded to a deserving Delaware boy. The appointment is made for one year only, but the incumbent for any one year may be reappointed.

Scholarship of the Princeton Club of Delaware

A scholarship amounting to $100 annually was founded in 1919 by the Princeton Club of Delaware. It will be awarded to a deserving Delaware boy.

The Robert Bayne Wheeler Scholarship

Mrs. Robert Bayne Wheeler has given to the college $2500, the income from which, amounting to about $125, is

to be given annually to a deserving Delaware boy to whom this amount will be of service in helping him to obtain an education.

Du Pont Scholarships

For the purpose of encouraging young men to specialize in chemistry, the E. I. du Pont de Nemours and Company offers two scholarships of $300 each to Senior students in chemistry.

President's Scholarship

Colonel Clarence Hodson, President of the Delaware Society of New York, has established the President's Scholarship of $250 for a Freshman from this state. Upon the tentative appointment by the faculty at the opening of the session, a payment of $50 will be made. If the candidate proves satisfactory by Thanksgiving, $150 will be paid in installments extending throughout the remainder of his Freshman year. To the same student in his Sophomore year, an additional payment of $50 in two installments will be made during the first term.

The Scholarship of the Sons of Delaware of Philadelphia

A scholarship of $300 was founded in 1919 by the Sons of Delaware of Philadelphia. It will be awarded annually to a Delaware boy. The incumbent for any one year may be reappointed.

The Tatum Memorial Lecture Fund

Mr. Ashton R. Tatum, a friend of the College, at his death left a fund of $1000, the income from which is to be devoted to lectures on the treatment and care of horses.

Libraries

The combined libraries of the college contain about 27,000 volumes.

Each department of instruction has its own library of reference works in its classroom or laboratory, under the immediate supervision of the professor in charge, from whom students may obtain books for use in connection with their work.

The general library, in which are most of the books on literature, history, economics, philosophy, etc., is, together with the reading-room, open to students from 8.15 A. M. to 10 P. M.

The library has been designated as one of the depositories for the public documents of the United States Government and from this source receives many valuable publications.

Several friends of the college have made valuable additions to the library by the presentation of books, magazines, and pictures, and further gifts are earnestly desired.

Through the courtesy of the publishers many of our State papers are regularly found on the tables of the Reading Room.

Athletics

Football, baseball, basketball, track athletics, and tennis are recognized as collegiate sports.

The general supervision of all athletic sports is vested in an athletic council composed of two members of the Faculty, two members of the Alumni Association, and three undergraduates, chosen from the three upper classes.

All eligibility rules originate with the Faculty.

Any student who is admitted to college later than the second Monday of a term is not eligible during that term to represent the college in outside athletic contests.

No student is permitted to represent the college on any athletic team or as manager of such, who is not in good standing in his class and doing, at the time, satisfactory work in his studies.

No student pursuing a course other than one leading to a degree will be permitted to represent the college in any athletic contest during his first year in residence, unless he

shall have satisfied the entrance requirements of a course leading to a degree.

Buildings and Grounds

A spacious gymnasium containing apparatus for gymnastic exercises, a running track, shower baths, and a swimming pool, affords ample accommodations for indoor athletic sports, such as basketball, indoor-running, swimming contests, wrestling, and boxing.

In Frazer Field, the college possesses one of the best athletic fields in the country. This field, completely equipped, was donated to the college by Mr. and Mrs. Eben B. Frazer, of Newark, and Mr. Stanley Frazer, '04, of New York City, as a memorial to a son and brother, Joseph Heckart Frazer, '03. The field contains a baseball diamond, football gridiron, tennis courts, and a quarter-mile cinder track with a 220-yard straightaway. It is enclosed with a hollow tile stucco wall and has a beautiful terrace along one side.

State Bacteriological and Pathological Laboratory

By Act of the Delaware Legislature, a State Bacteriological and Pathological Laboratory has been established at the college. The Laboratory is under the management of the State Board of Health. Its location makes accessible the resources of the college in the way of libraries and apparatus.

Organizations

The Agricultural Club. The Agricultural Club is composed of the agricultural students and some members of the Faculty. It is under the management of the students, who elect their officers each term. Meetings are held weekly and subjects relating to both class work and actual farm practice are discussed. Lecturers of repute address the club on agricultural subjects. The object of the club is to create enthusiasm and to promote the interests of agriculture among the students as well as to accustom the members to talk on agricultural subjects before an audience.

Athletic Council. The Athletic Council is in direct charge of all athletic activities not constituting a part of the college curriculum. It is composed of two representatives from the Faculty, two representatives from the Alumni, and three representatives from the Students, representing respectively the Senior, Junior, and Sophomore classes.

Chess Club. The Delaware College Chess Club maintains a team for intercollegiate matches and within its own membership conducts a number of tournaments through the college year. Two members of the College Faculty act as advisers and coaches for the Club and team.

Engineering Society. Membership in the Engineering Society is limited to Sophomores, Juniors, and Seniors, and to Instructors in the Department. Open meetings are occasionally held.

Varsity Club. The Varsity Club is an organization composed of students who have earned their Varsity D. The purpose of the club is to create and maintain a better feeling among the letter men and to offer in its membership an additional reward to the mere earning of the letter.

Derelicts. The Derelicts is an honorary senior fraternity, the purpose of which is to create a spirit of good-fellowship throughout the Senior Class and the Student Body. The members of the Junior Class who are elected as members are informed of their election on the day of the Annual Inter-scholastic Track and Field Meet on Joe Frazer Field.

Wolf Chemical Club. The Wolf Chemical Club is an organization composed of undergraduate chemistry students of the college. The purpose of the club is to interest the students in the science of chemistry and to furnish a medium through which they may come into closer contact with members of the Faculty and outside professional men.

Faculty Club. A Faculty Club was organized in 1918 for the purpose of promoting social intercourse among the members of the Faculty.

Footlights Club. The purpose of this organization is to present serious plays, comedies, and farces, in Newark or out of town as conditions may determine. No previous experience in dramatic work is required for admission to membership. Any student in Delaware College is eligible to apply for active membership, and any alumnus or member of the faculty may apply for honorary membership.

Fraternities. Three national Greek letter fraternities have local chapters at the college: Kappa Alpha (Southern), Sigma Nu, and Sigma Phi Epsilon. A fourth organization, Omega Alpha, is local. Three of these fraternities own their houses. The average resident membership is about sixteen.

Phi Kappa Phi. A Chapter of the Phi Kappa Phi, an honorary fraternity devoted to the interests of Scholarship, was established at the college in 1905.

Publications

The regular publications of the college consist of the Delaware College Review, the Bulletin, and the Experiment Station Bulletin.

The Review. The Review is a weekly publication devoted to the general interest of the students. The subscription price is $1.50 a year.

The **Bulletin** is issued quarterly. One of the four numbers is the Catalogue number. The **Experiment Station Bulletin** is issued quarterly by the Experiment Station. One of the numbers is the Annual Report. These bulletins will be sent to any address.

Students' Loan Fund. A Loan Fund to help needy students was established by the Alumni Association in 1915. The object of the Committee, which was appointed by the President of the Association, is to raise a substantial sum of money which will be placed in trust and the income of which will be used to help deserving students. Definite

amounts will be loaned to students on promissory notes which the student is expected to meet as soon as he is financially able.

Alumni Organizations and Activities

The Alumni Association of Delaware College is the central organization for the general body of Alumni. Membership is limited to graduates, and to former students who may be elected by the Association.

The Annual Business Meeting is held on the Saturday preceding Commencement Day each year. In the evening various reunions and celebrations are held. A mid-winter dinner is held every year at the College on the Saturday nearest to Washington's Birthday.

A silver cup is offered by the Association to be competed for in an annual debate between teams representing the Sophomore and Freshman classes. This cup will become the property of the class which wins two debates. Medals for winners of events in the Inter-Class Track and Field Meet, and for athletes who break college records, are given by individuals among the Alumni.

The official organ of the Alumni Association is the Alumni News, a quarterly. The publication of this paper, which was suspended during the war, has just been resumed. The subscription price, which includes membership in the organization, is $2 per year. The Editor is George E. Dutton, '04, and the Business Manager, C. A. Short, '96.

Ways and Means Committee for 1919-1920: W. R. Edgar, '10, chairman; George L. Medill, '99; Frank Collins, '89; A. C. Ward, '06; F. Irving Walls, '11; and the officers of the Association ex-officio.

The officers of the General Alumni Association for 1919-1920 are: President, John E. Greiner, '80; Vice-President, George N. Davis, '98; Secretary and Treasurer, George E. Dutton, '04.

Graduates in various parts of the country have begun to organize branch alumni associations. Up to the present time, four active branches have been formed: The Western Pennsylvania Section, Pittsburgh, Pa.; the New England Society, Boston, Mass.; the Philadelphia Society, Philadelphia, Pa.; and the Lower Delaware Society.

DEGREES CONFERRED AT THE ANNUAL COMMENCEMENT

June 9, 1919

Civil Engineer

William Alexander Reynolds.....New York, N. Y.

Mechanical Engineer

Allen Sherwood Wise.....Wilmington

Electrical Engineer

Leo Blumberg .....Wilmington
Harry Thomas Montgomery .....Charlestown, Md.

Bachelor of Arts (Arts and Science Course)

Edward Selman Cannon .....Wilmington
George Wilson Hearne .....Washington, D. C.
Edmund Wollaston Henvis .....Wilmington
John Alfred Mackie .....Kemblesville, Pa.
James Gordon McMillan .....Wilmington
Morris Randolph Mitchell .....Newark
William Arthur Wise .....Wilmington

Bachelor of Science (Arts and Science Course)

John Gilbert Craig .....Wilmington
Earle Elisha Ewing .....Wilmington
John Poole Gum .....Frankford
Henry Burton Mitchell, Jr. .....Millsboro
Louis Robert Plam .....Brooklyn, N. Y.
Charles Ide Sutfin .....Wilmington

Bachelor of Science in Agriculture

John Lawson Crothers .....Mt. Pleasant
Richard Earle Dickey .....Stanton
George Madara Longland .....Mt. Pleasant
Henry White Marston .....Wilmington
Fred Boorman Martenis .....Wilmington
John Hazel Meredith .....Goldsboro, Md.
Francis Leonard O'Rourke .....Newark
Firman Clarence Penuel .....Georgetown
Russell Davis Stukgis .....Wilmington
Alfred Bailey Thomas .....Philadelphia, Pa.
Marvel Wilson .....Milford

Bachelor of Science in Mechanical Engineering

Lawrence Landon Smart .....Baltimore, Md.

Bachelor of Science in Electrical Engineering

Hugh Wagner Downing ..... Philadelphia, Pa.
George Millard Lang ..... Wilmington
Joseph Pierson Maxwell ..... Wilmington
William McKinney ..... Wilmington
William Springer Moore ..... Wilmington
Albert Slack Walton ..... Newark

Bachelor of Science in Chemical Engineering

Daniel Paddock Barnard, 4th ..... Wilmington
Garrett Reed Cantwell ..... Elsmere
James Willard Humphrey ..... Claymont
William Scott Levey ..... Christiana
Irviene Reed McElwee ..... Wilmington
Jay Robinson ..... Wilmington

Prizes, Scholarships, and Honors Announced at the Commencement of 1919

The Bishop Coleman Memorial Prize: James Willard Humphrey.

The Lieutenant Clarke Churchman Memorial Prize: Hugh Wagner Downing.

The William D. Clark Prize for Mathematics: James Draper Craig.

The Trustee Prize: Francis Bayard Carter.

The State Grange Prizes: First, Claude Ellis Phillips; second, Joseph Irwin Jefferis; third, Fred Boorman Martenis.

The Robert Bayne Wheeler Scholarship for 1919-20 was awarded to Oliver Winfield Goffigon.

Two du Pont Scholarships in Chemistry were awarded to Eugene Harlan Kennedy and Ralph Pickering Kennedy.

The Scholarship of the Harvard, Princeton, and Yale Clubs of Delaware for 1919-20 was awarded to John Fletcher Price.

The Princeton Scholarship for 1919-20 was awarded to Leon Yacobyan.

The Sons of Delaware Scholarship for 1919-20 was awarded to Charles Norman Wade.

The President's Scholarship for 1919-20 was awarded to Howard Beidleman Yost.

The following members of the Class of 1919 were elected to the Honorary Fraternity of Phi Kappa Phi:

Hugh Wagner Downing
Fred Boorman Martenis
Edmund Wollaston Henvis
Willard Springer Moore
George Madara Longland
Jay Robinson
John Alfred Mackie

Students in Attendance During the Collegiate Year 1919-1920

Abbreviations: A. & S., Arts and Science; A., Agriculture; C. E., Civil Engineering; M. E., Mechanical Engineering; E. E., Electrical Engineering; Ch. E., Chemical Engineering; M. T., Marine Transportation; E., Engineering not specified.

SENIOR CLASS

Alderson, John Hartzell	A. & S.	Chestertown, Md.
Anderson, John White, 3d	E. E.	Wilmington
Arbuckle, Paul Taylor, Jr.	Ch. E.	Cherry Hill, Md.
Barnard, William Ellison	A. & S.	Camden
Blair, Alexander, Jr.	A. & S.	Wilmington
Brower, George Clarence	M. E.	Federalsburg, Md.
Carswell, Charlesworth	C. E.	Wilmington
Carter, Francis Bayard	A. & S.	Newark
Colpitts, Robert Adrian	M. E.	Mt. Pleasant
Cullen, George Steele	A.	Elkview, Pa.
Ely, George Amos	A.	Winterthur
Fell, Harvey Lewis	A.	Wilmington
Graves, Reed	M. E.	Marietta, Pa.
Grier, Harold Caulk	A. & S.	Milford
Heinel, Arthur Garret	A. & S.	Newark
Hudson, George Henry, Jr.	C. E.	Wilmington
Jefferis, Joseph Irwin	A.	Stanton
Kennedy, Eugene Harlan	Ch. E.	Newark
Kennedy, Ralph Pickering	Ch. E.	Marshallton
Kite, Robert Paul	Ch. E.	Wilmington
Lattomus, Winfield Wilson	C. E.	Townsend
Lindell, William Francis	E. E.	Newark
Little, James Herman	E. E.	Newark
Loomis, Stanley Drake	E. E.	Meshoppen, Pa.
Loose, Harry Walter	M. E.	Wilmington
McCardell, Frank Paul	A.	Wilmington
McKay, Herman	A. & S.	Wilmington
Nelson, George Merle	E. E.	Delmar
O'Neill, John Francis	Ch. E.	Wilmington
Plam, Michael Walter	E. E.	Brooklyn, N. Y.
Pool, Frank Robinson, Jr.	A.	McDonough
Russo, Julio	E. E.	Wilmington
Shaw, Merville Charles	E. E.	Wilmington
Smith, Draper	A. & S.	Wilmington
Stewart, William, Jr.	A. & S.	Wilmington

Taylor, Leonard Kittinger Moore	M. E.	West Chester, Pa.
Terrell, Hasson Taylor	Ch. E.	Elkton, Md.
Thomas, Norman	M. E.	Canterbury
Truss, James Petheram	A. & S.	Wilmington
Tunnell, Charles Rodney	A.	Georgetown
Weigle, Charles Leland	A. & S.	Wilmington
Whiteman, Thomas Moore	A.	Delaware City
Yacobyan, Leon	M. E.	Wilmington

JUNIOR CLASS

Aikens, George Holton	A. & S.	Wilmington
Alexander, Howard Berton	A.	Oil City, Pa.
Anderson, William Thomas	E. E.	Henry Clay
Attix, Charles Thomas	A. & S.	Kenton
Barnard, John Arnold, Jr.	A.	Wyoming
Boggs, Irving Hook	M. E.	Dover
Boulden, Marion Packard	C. E.	Elkton, Md.
Bradley, Henry George	A. & S.	Wilmington
Broughall, William Templin	A. & S.	Wilmington
Brown, Harvey Newton	A. & S.	Newark
Cooch, Francis Allyn, Jr.	A.	Newark
Craig, James Draper	Ch. E.	New Castle
Denney, Courtland Forrest	Ch. E.	Wilmington
Dole, Thomas Hyde	Ch. E.	Wilmington
Donoho, William Claggett Dorsey	A. & S.	Seaford
Elzey, Welton Franklin	A.	Seaford
Evans, Clarence William	A. & S.	Newark
Fairbanks, Joseph Harrison	A. & S.	Wilmington
Foulk, William Henry	A. & S.	Wilmington
Frederick, William Heisler	C. E.	Marshallton
Gass, Charles Wardon	E. E.	Marshallton
Gordy, Leon Hackett	M. E.	Wilmington
Handy, Roland Cookman	A.	Federalsburg, Md.
Hemphill, William Albert	C. E.	Delaware City
Holland, Thomas Wilmer	Ch. E.	Smyrna
Horty, James Albert	C. E.	Wilmington
Johnson, Allen Jaquith	M. E.	Middletown
Jones, Harry Herman	A.	Woodside
Keesey, Russell Kirk	E. E.	Perryville, Md.
Killen, William Meredith	A.	Felton
Kohlerman, James Harold	Ch. E.	Wilmington
Levandis, John Alexander	A. & S.	Wilmington
Lindsay, Walter David	E. E.	Providence, Md.
Lynch, Charles Stewart	A. & S.	Wilmington
Madden, George Harney	A. & S.	New Castle
Marvel, Phillip Henry	E. E.	Houston
McCaughan, Hugh, Jr.	Ch. E.	Wilmington
McMullen, Joshua Willard	A. & S.	Lincoln Univ., Pa.

McMullen, Richard Hutchinson	E. E.	Wilmington
McWhorter, John Francis, Jr.	Ch. E.	Middletown
Monaghan, Paul Kane	A. & S.	Wilmington
Mulrooney, Thomas William	Ch. E.	Wilmington
Olcott, John Woodward	A.	Washington, D. C.
Perchick, Samuel Leon	A.	Philadelphia, Pa.
Phillips, Claude Ellis	A.	Delmar
Pool, Jefferson Foard	A.	McDonough
Preston, Ira Lucas	C. E.	Trenton, N. J.
Price, George Cleaver	M. E.	Newark
Price, John Fletcher	Ch. E.	Carneys Point, N. J.
Ritz, Walter Raymond	A. & S.	Newark
Sipple, George Massey	C. E.	Milford
Smyth, William John	C. E.	Wilmington
Spaid, Arthur Farquhar	A. & S.	Dover
Steele, Ira Kenneth	M. E.	Newark
Taggart, Rudulph York	C. E.	Elkton, Md.
Tonkin, Enoch George	C. E.	Wilmington
Waples, George Franklin	A. & S.	Milton
Wilson, Joseph Samuel	A.	Georgetown
Wise, Joseph Coley	M. E.	Smyrna
Wood, Melvin Frederick	C. E.	Delaware City

SOPHOMORE CLASS

Allen, Alvan	Ch. E.	Wilmington
Allmond, David Robinson, Jr.	C. E.	Wilmington
Ayerst, Albert Douglas	Ch. E.	Elkton, Md.
Baumgardt, William Christian	A. & S.	Richardson Park
Brewer, Wayne Curtis	E. E.	Lewes
Brown, John Wilmot	C. E.	Dover
Bugless, Edgar	E. E.	Wilmington
Burbage, Arthur Vernon	Ch. E.	Berlin, Md.
Carll, Robert Heath	A.	Camden, N. J.
Carter, George Gray	Ch. E.	Newark
Carter, Maynard Harper	Ch. E.	Wilmington
Challenger, Barclay Roberts	M. E.	Claymont
Chambers, Gilbert Dickey	A. & S.	Newark
Christfield, John Gilbert	M. E.	Wilmington
Daly, Leonard Barrett	A.	Philadelphia, Pa.
Dantz, Theodore Roosevelt	Ch. E.	Lincoln Univ., Pa.
Dare, Charles Rulon	Ch. E.	Jamesburg, N. J.
De Luca, John James	A. & S.	Wilmington
Deppe, Florian Rudolph, Jr.	M. E.	Philadelphia, Pa.
Draper, Milton Lowber	Ch. E.	Wyoming
Fisher, Lindale Carson	A. & S.	Wyoming
Fletcher, Robert Paulson, Jr.	E. E.	Wilmington
Foulk, Robert North	A. & S.	Wilmington
Gela, William	A. & S.	Philadelphia, Pa.

Geoghegan, Henry	Ch. E.	Newark, Md.
Goffigon, Oliver Winfield	M. E.	Marionville, Va.
Hallett, William Emerson	E. E.	Milford
Hardin, Paul Eugene	A. & S.	Wilmington
Harmer, William Frederick	A. & S.	Philadelphia, Pa.
Harper, Joseph Howard	A.	Still Pond, Md.
Hollett, Joseph Lawrence	Ch. E.	New Castle
Holton, Walter Dean	A. & S.	Newark
Hopkins, Melvin	A. & S.	Dover
Hurff, Leland	A.	Elmer, N. J.
Ivory, Harry Standerman	Ch. E.	Camden, N. J.
Jacobs, William Franklin Pierce, Jr.	E. E.	Smyrna
Kalmy, George Garabed	A.	Boston, Mass.
Kavanaugh, Joseph Charles	E. E.	Wilmington
Keith, Thomas Muncy	A. & S.	Dover
Lemmon, Norman Edward	Ch. E.	Wilmington
Lilly, William Stavely, 3d	A. & S.	Philadelphia, Pa.
Lynch, Howard Eldridge, Jr.	C. E.	Dover
Magee, Arley Benjamin, Jr.	A. & S.	Dover
Maroney, Samuel Patterson	Ch. E.	Wilmington
McDonnell, Thomas Joseph	C. E.	Wilmington
Meyers, Joseph Shelly	A. & S.	Middletown
Mowlds, William Lyle	A.	Bellevue
Reed, Albert Chrisman	M. E.	Washington, D. C.
Repp, Harold Colbelt	M. E.	Philadelphia, Pa.
Roemer, Louis Edward	Ch. E.	Wilmington
Rothrock, Joseph John	A. & S.	New Castle
Rovner, Joseph Robert	C. E.	Philadelphia, Pa.
Russo, Joseph Romeo	A. & S.	Wilmington
Sackett, Benjamin Richardson	E.	Philadelphia, Pa.
Singley, John	A.	Philadelphia, Pa.
Smith, Gerald Camille	C. E.	Wilmington
Smith, Walter Dent	E. E.	Wilmington
Stewart, Robert	A. & S.	Wilmington
Triggs, Willard Robinson	M. E.	Wilmington
Twoes, Stanley French	Ch. E.	Camden, N. J.
Wills, Franklin Knight	C. E.	Wilmington
Wilson, John Edwin, Jr.	C. E.	Smyrna
Wood, Joseph Chandler	Ch. E.	Wilmington
Woodrow, Charles Whitney	Ch. E.	Wilmington
Young, Howard Pollock	M. E.	Wilmington
Zimmerman, Harry Franklin	Ch. E.	Wilmington

FRESHMAN CLASS

Armstrong, Thomas Pilling	A. & S.	Newark
Ash, Earl Spruance	M. E.	Richardson Park
Barnard, Edward Reynolds	M. T.	Wilmington

Barron, Clifford Allwyn	A. & S.	Philadelphia, Pa.
Baxter, James Morton	A. & S.	Wilmington
Betty, Clifford Alexander	E. E.	Wilmington
Betty, Robert, Jr.	E. E.	Montchanin
Blackstone, John Paynter Frame	A. & S.	Georgetown
Bland, William Ellsworth	E.	Newark
Blanton, Frank Mitchell	A. & S.	Elkton, Md.
Boyce, Willard Davis	A. & S.	Cheswold
Brandt, Earl DeWitt	Ch. E.	Camden, N. J.
Burnite, Alvin Warrington	M. E.	Wilmington
Cann, William Lewis	E. E.	Elkton, Md.
Carr, Albert Edwin	A.	Wilmington
Carter, Herbert Hilder	E. E.	Edge Moor
Challenger, John Franklin	E. E.	Claymont
Cloward, Thomas MacDonough	E.	Perryville, Md.
Cole, Harry Richardson	Ch. E.	Dover
Collins, Theodore	A. & S.	Milford
Cook, Herman Wallace	A.	Newark
Cooper, Ezekiel, Jr.	M. E.	New Castle
Crawford, Howard Favorite, Jr.	M. E.	Wilmington
Crew, Leonard Shaw	E. E.	Wilmington
Crothers, Wesley Gifford	A. & S.	North East, Md.
Cummings, Courtney Hampton	A. & S.	Newark
Dane, Bernard Benjamin	A. & S.	Wilmington
Daniels, Harold	M. E.	Pennsgrove, N. J.
Davis, Robert Brandon	A. & S.	Wilmington
Devitt, Daniel Edwin	A.	Georgetown
Doragh, Arthur Douglas	E. E.	Greenville
Dorsey, Harold Burns	Ch. E.	Wilmington
Draper, Henry Carlton	A. & S.	Milton
Eaton, Richard Bozman	C. E.	Parksley, Va.
Elliott, James Grayson	A. & S.	Delmar
Evans, Hubert Melbourne	A. & S.	Cochranville, Pa.
Ewing, William Moffitt	M. E.	West Grove, Pa.
Farmer, Francis John	A. & S.	New Castle
Feddeman, Richard Earle, Jr.	E.	Millington, Md.
Ferguson, Jeremiah Sweetser, Jr.	A. & S.	New York, N. Y.
Ferguson, William Edward	E. E.	Bridgeville
Finkelberg, Joseph Louis	A. & S.	Philadelphia, Pa.
Fletcher, Northrop Rogers	M. E.	Wilmington
Fockler, Edwin Benjamin, Jr.	E. E.	North East, Md.
France, John Butz	E. E.	Wilmington
Gallo, Anthony James	C. E.	Wilmington
Gedling, Edwin Lambdin	Ch. E.	Richardson Park
Gilbert, Walter Mairs	A.	Spring City, Pa.
Gluckman, Leslie Hilton	A. & S.	Wilmington
Gray, Herbert Wendell	A. & S.	Wilmington
Grier, William Humes	Ch. E.	Milford
Haines, Harlan Fisher	A. & S.	Seaford

Hardesty, William Franklin	C. E.	Seaford
Harvey, Frank Bates	M. E.	Elkton, Md.
Hawke, LeRoy Francis	E. E.	Wilmington
Hendrickson, Walter Thomas	C. E.	Marshallton
Hoey, Edwin Anderson	M. E.	Dover
Hofberg, Charles Arthur	A.	Aldan, Pa.
Hofberg, Olaf	A.	Aldan, Pa.
Howard, Charles Wooster	E.	Salisbury, Md.
Hughes, Jesse Edward	C. E.	Bridgeport, N. J.
Humphreys, Albert Orgain	A.	Wilmington
Jackson, William Spencer	E.	Dover
Jones, Edward Gorges Pardee	C. E.	Woodside
Jones, Wilmer Dewey	A. & S.	Wilmington
Layton, Asbury Burke	A. & S.	Richardson Park
Lewis, William Howard	E. E.	Elkton, Md.
Linn, Gordon Lee Ernest	E.	Wilmington
Long, Hix, Jr.	Ch. E.	Denton, Md.
Long, Robert Windill	Ch. E.	Childs, Md.
Lund, Harold Mayne	M. E.	Landenburg, Pa.
Lynch, John Mitchell	A.	Lewes
Magaw, Everett Lewis	C. E.	Marshallton
Magaw, Ralph England	C. E.	Marshallton
Marcus, Reuben	M. E.	Philadelphia, Pa.
Marvin, John Swift	A. & S.	Camden
Mather, Irwin Emerson	M. T.	Oswego, Kan.
Maxwell, Harry Edward	M. E.	Richardson Park
McGovern, John Joseph	C. E.	Wilmington
McManus, George Bright	A.	Wilmington
McMillan, Herbert Wayne	A.	Landenburg, Pa.
Meyers, William Kulp	A. & S.	Middletown
Mitchell, George Sinclair	A. & S.	Newark
Mowlds, Eugene, Jr.	A.	Edge Moor
Murphy, Jay Edward	E. E.	Milford
Murray, John Joseph, Jr.	C. E.	Wilmington
Murray, Roger	A. & S.	Wilmington
Nordquist, David Emanuel	A. & S.	Wilmington
Nutter, Charles Armel	E. E.	Milford
Owens, Charles Lester	A. & S.	Bridgeville
Patton, Joseph Leslie	E.	Wilmington
Peirce, Edgar Herbert	A.	Embreeville, Pa.
Pitman, Edwin Price	C. E.	Delanco, N. J.
Price, Clifford Banks	E. E.	Harrington
Price, Raymond Roberts	C. E.	Sudlersville, Md.
Pyle, Theodore Howell	A. & S.	Wilmington
Ramsey, Richard Earl	A. & S.	Newark
Ransom, John Harvey	A.	Smyrna
Rawson, William Henry	E.	Salisbury, Md.
Reed, Lewis Paul	C. E.	Chestnut Hill, Pa.
Reynolds, Charles Willard	M. E.	North East, Md.

Riley, Carl Edward	A. & S.	Newark
Robbins, James Ponder, Jr.	A. & S.	Wilmington
Robinson, Granville Stott	A. & S.	Newark
Robinson, Walter Donoho	A. & S.	Seaford
Rose, Edgar Newman	A. & S.	Newark
Rowan, Frederick Johnson	A. & S.	Newark
Schimel, Abraham	Ch. E.	Wilmington
Seaman, Elias Haviland	Ch. E.	Glens Falls, N. Y.
Sentman, Cornelius Brokaw	M. E.	New Castle
Stewart, Eugene Lyman	M. E.	New Rochelle, N. Y.
Strickler, Frank Downing	E.	Wilmington
Swezey, William Francis	E. E.	Wilmington
Tatnall, Joseph Swift	E. E.	Wilmington
Tebo, George Dwight	A. & S.	Dover
Thielman, Joseph Anthony	E.	New Castle
Tilghman, James Edwin	A. & S.	Cape Charles, Va.
Underwood, Clarence Joseph	Ch. E.	Wilmington
Viohl, Herbert Kairt Wetherill	M. E.	Wilmington
Wade, Charles Norman	A. & S.	Wilmington
Webb, John Loud	E. E.	Wyoming
Wells, John Murphy	M. E.	Wilmington
Williams, John Davidson	E. E.	Newark
Wintrup, Joseph Paul	A. & S.	Wilmington
Wise, Carl Thomas	A. & S.	Wilmington
Woodward, James Dilworth	A.	Wilmington
Yost, Howard Beidleman	M. T.	Wilmington

SPECIAL STUDENTS

Chambers, James Brady	A.	Lewes
Marconetti, Arrigo Eugene	M. E.	New York, N. Y.
Short, Wingate Daniel	A. & S.	Claymont

VOCATIONAL STUDENTS

Else, Frank	A.	Philadelphia, Pa.
Hahn, James W.	A.	Philadelphia, Pa.

Summary

	Arts and Science	Agriculture	Engineering	Total
Seniors	11	8	24	43
Juniors	17	12	31	60
Sophomores	17	7	42	66
Freshmen	41	14	72	127
Special	1	1	1	3
Vocational	..	2	..	2
	87	44	170	301

General Summary

Delaware College	301
Women's College of Delaware	133
Summer School of 1919	241
Academic Extension	64
Grand Total	739

UNIVERSITY OF ILLINOIS-URBANA
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